

MARYLAND HIGHER EDUCATION COMMISSION  
ACADEMIC PROGRAM PROPOSAL

PROPOSAL FOR:

- ☒ NEW INSTRUCTIONAL PROGRAM  
☐ SUBSTANTIAL EXPANSION/MAJOR MODIFICATION  
☐ COOPERATIVE DEGREE PROGRAM  
☐ WITHIN EXISTING RESOURCES or ☐ REQUIRING NEW RESOURCES

(For each proposed program, attach a separate cover page. For example, two cover pages would accompany a proposal for a degree program and a certificate program.)

Lincoln College of Technology  
Institution Submitting Proposal

6/26/17  
Projected Implementation Date

Associate  
Award to be Offered

Electrical and Electronic Systems Technology  
Service Title of Proposed Program  
Management

\$ 0909.00  
Suggested HEGIS Code

46.0302  
Suggested CIP Code

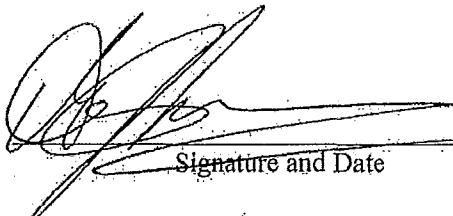
Electronics  
Department of Proposed Program

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Signature and Date

President/Chief Executive Approval

12/8/16  
Date

Date Endorsed/Approved by Governing Board

Lincoln College of Technology is requesting approval of the Electrical and Electronic Systems Technology Lower Division Certificate (CIP Code: 46.0302) and Electrical and Electronic Systems Technology Service Management Associate of Applied Science Degree (CIP Code: 46.0302). These programs will be implemented while still offering the current Electronic Systems Technician Lower Division Certificate (CIP Code: 47.0101) and the Technology and Skilled Trades Associate of Applied Science Degree (CIP Code: 46.9999). Once all agencies have approved the proposed programs, a teach-out of the old programs will take place while ramping up the new programs. This will move the financial infrastructure from one program to the next.

**A. Centrality to mission and planning priorities, relationship to the program emphasis as outlined in the mission statements and an institutional priority for program development.**

The mission of Lincoln College of Technology is to prepare its students to be successful in their chosen career field by delivering curriculum through a diverse set of educational experiences that will promote an appreciation of lifelong learning and assist with every graduate's professional mobility in their occupation.

Consequently, this proposal to offer a Lower Division Certificate in Electrical and Electronic Systems Technology and an Associate of Applied Science Degree in Electrical and Electronic Systems Technology Service Management is both consistent with the institution's mission and will contribute to prompting students who will be gainfully employed.

**B. Critical and compelling regional or statewide need as identified in the State Plan.**

*Maryland Ready's* first goal centers on maintain and improving the quality and effectiveness of postsecondary institutions. "Quality refers to the degree to which an institution successfully achieves its goals..." One measure of the success is the placement rates of the existing Electronic Systems Technician Lower Division Certificate (CIP Code: 47.0101) which were at 81% and the existing Technology and Skilled Trades Associate of Applied Science Degree (CIP Code: 46.9999) which were at 100%. Toward the goal of improving effectiveness, Lincoln College of Technology holds two (2) Advisory Board Meeting each year inviting employers in the field to meet and discuss how the college can meet the changing needs in the fields for which we train.

*Maryland Ready's* second goal is access, affordability and completion. Lincoln College of Technology offers students entering directly from high school into the college arena the opportunity to take developmental courses in mathematics and English. This insures the readiness of college students to complete their program successfully. All students at Lincoln College of Technology are required to complete financial literacy modules. Lincoln College of Technology adheres to and maintains the completion rates set by the Accrediting Commission of Career Schools and Colleges.

*Maryland Ready's* third goal is diversity. As reported in the 2016 MHEC Annual Report S-1 and S-9 forms, Lincoln College of Technology's environment is "infused with diversity" including age, race, ethnicity and sex. The college has staff and programs including *Career Edge* that supports the community of diversity and acceptance to enhance learning.

*Maryland Ready's* fourth goal is innovation. Lincoln College of Technology has always embraced the competency-based education simply by the nature of the technical education. Incoming students are

offered several ways to transfer in credits including direct transfer of like-credits, test-out situations where they can perform the tasks and are given credit, College Board Advance Placement (AP) courses, International Baccalaureate (IB) courses, completion of College Level Examination Program (CLEP) testing, and completion of military experience through DANTES, DSST exams or as shown on an American Council on Education (ACE) transcript.

Successful course completion is based on a variety of methods including written exams/assessments as well as practical/competency based assessments.

*Maryland Ready's* fifth goal is economic growth and vitality. Previously was discussed the use of employers as Advisory Boards to keep current with the industry related needs. This relates to the STEM education focus of K—12<sup>th</sup> grade and keeps the growth of the economy in the forefront of the colleges training.

**C. Quantifiable and reliable evidence and documentation of market supply and demand in the region and service area:**

The National Center for Education Statistics (NCES) defines 'Electrical and Electronic Technician' programs as those that prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems such as residential, commercial, and industrial electric-power wiring; and DC and AC motors, controls, and electrical distribution panels. Includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.

The table below demonstrates the state's potential demand for graduates of programs like that proposed. This evidence of projected demand is based on the programs proposed Classification of Program (CIP) code 46.0302, Electrical and Electronic Systems Technician form <http://www.dlir.state.md.us/lmi/iandoproj/maryland.shtml>.

Table I

Occupational Title	Openings			Education Value
	2014	2024	Change	
Electrical and Electronic Technicians	3878	4296	10.78%	Post-Secondary/Associates Degree

The table below outlines the current supply of graduates from Maryland programs with the CIP code of 46.0302 (Construction Trades—Electrical and Electronic Technicians).

Table II

School Name	Degree Level	Taxonomy	Program Name	Graduates				
				2015	2014	2013	2012	2011
College of Southern Maryland	Associate's Degree	460302	Electrical Wiring Technician	0	0	0	0	0

Montgomery College—All Campuses	Lower Division Certificate	460302	Electrical Wiring	3	6	4	5	3
Brightwood College (TEST)	Lower Division Certificate	460302	Electrical Technician	No information				
Total				3	6	4	5	3

<http://www.mhec.maryland.gov/publications/research/AnnualReports>

These two tables illustrate that although there is a projected increase of 418 jobs between 2014 and 2024, there is a lack of qualified candidates graduating from area programs to fill these needs.

#### D. Reasonableness of program duplication, if any

While 3 other programs exist at Maryland's post-secondary institutions, the total number of graduated in the last 5 years from the existing programs is 24. In Lincoln College of Technology's existing program there have been 232 graduates. Enhancing the program will provide the necessary available, qualified work force to assist the state in meeting its demand for this profession.

#### E. Relevance to the implementation or maintenance of high demand programs at HBI's:

Table II above demonstrates that no Historically Black College of University currently offer an Electrical and Electronics Technician program.

#### F. Relevance to the support of the uniqueness and institutional identities and mission of HBIs:

As we implement this program, we will be looking to develop and partner with the HBCU's in the area in consideration of an articulation agreement to higher level degrees.

#### G. Adequacy of curriculum design and delivery to related learning outcomes consistent with Regulation .10 of this chapter:

Please see Attachment 1 Course information

#### H. Adequacy of any articulation:

There are no current articulation agreements in place with this program.

#### I. Adequacy of faculty resources consistent with Regulation .11 of this chapter:

Table III

Faulty Name	Degree	Full Time	Courses Taught
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Joseph Travis	Certificate	Full-Time	EEST106—Electrical Controls (3.5) EEST108—Fiber Optics, Telecommunication Systems & PLC (3.5) EEST109—Security Systems, Access Control & CCTV Systems (3.5) EEST110—Fire Alarm Systems (3.5) EEST211—A/V, Home Theater and Satellite/Cable TV (3.5) EEST212—System Integration (3.5)
Jose Ibarondo	MS/MBA	Full-Time	EEST103—Electronic and Electrical Principles (3.5) EEST105—Electrical Wiring Principles (3.5) EEST107—Computers and Networking (3.5)
Barry Willard	BS	Full-Time	EEST101—Introduction to the Trades (3.5) EEST102—Material Applications (3.5) EEST110—Fire Alarm Systems (3.5) EEST212—System Integration (3.5)
Winnie Shabazz	MA	Full-Time	GEN190—English Composition I (3) GEN292—Speech Communications (3) GEN099—Foundation of English (3)
James Lyman	MA	Part-Time Adjunct	GEN130—Introduction to Critical Thinking (3) GEN160—Psychology (3) GEN162—American Government (3)

Additional qualified faculty will be brought on staff to teach specific courses in Electrical, Math and Algebra.

**J. Adequacy of library resources consistent with regulation .12 of this chapter.**

The Library has the resources to support the current program and will be upgrades to support the new courses. The Library is open from 8:00AM to 10PM Monday—Thursday and 8:00AM—4PM on Friday. There is an on-line Library recourse, InfoTrak, <http://find.galegroup.com/menu/commonmenu.do?userGroupName=columbiatl>, that all students can access through any computer.

**K. Adequacy of physical facilities, infrastructure and instructional equipment consistent with Regulation .13 of this chapter.**

The area consists of 6 classrooms and labs, and a Smart house.

Please see the Attachment 2--list of equipment and books.

**L. Adequacy of financial resources with documentation consistent with Regulation .14 of this chapter.**

Please see Attachment 3--Table1resources and Attachment 4--Table2expenditures.

**M. Adequacy of provisions for evaluation of program consistent with Regulation .15 of this chapter.**

Lincoln College of Technology adheres to the Accrediting Commission of Career Schools and Colleges guidelines in assessing student outcomes.

**N. Consistency with the Commission's minority student achievement goals.**

Lincoln College of Technology is committed to high achievement goals amongst all of its students. As discussed prior in section B, there are many supports for all students to be successful and reach achievement goals set by the Accrediting Commission of Career Schools and Colleges.

**O. Relationship to low productivity programs identifies by the Commission.**

This is not a low productivity program

## EEST410C Electrical and Electronic Systems Technology

Lower Division Certificate – Columbia

CIP CODE: 45-0302 SOC Code 47-2141.00

**Total Instructional Hours: 1080**

**Total Program Credits: 42.0 Semester Credits**

**Program Length: Day & Evening – Approximately 47 weeks (including holidays and scheduled breaks)**

### Program Objective:

This program is designed to provide the essential skills and knowledge for the installation, troubleshooting, repair, and maintenance of commercial and residential entertainment, security, monitoring, and telecommunications systems. Students learn to install cable support structures; laying out and preparing pathways for wiring and cables; installing, securing, testing, and termination of wiring and cables both copper and fiber optic; program digital components and access controls to perform their designated tasks; install and set up media management systems; and perform system commissioning and user training of audio, video, and data systems. The program also prepares students on the essential skills and knowledge needed for entry-level residential electrician work. Students will train on the installation, service and maintenance areas of the residential electrical industry.

Upon completion of this program, graduates can meet the minimum requirements needed to be qualified as an entry-level technician in the residential and/or commercial telecommunications, fire alarm, intrusion detection, nurse call and signaling, entertainment, audio/video/data, and energy management systems. Student can also qualify as entry-level residential electrician's apprentice.

For Master electrician exam, the applicant shall not show less than seven (7) years of experience preceding the date of the application, under the direction and supervision of a master electrician, three (3) years during which the applicant supervised or was actively in charge of electrical installation work. The Board may credit not more than three (3) years for formal course study or professional training in electrical installation, where applicable. Students will be required to complete out-of-class assignment in each course.

### Program Content:

Course Number	Course Title	Lecture Hours	Lab/Shop Hours	Total Contact Hours	Total Credits
EEST101	Introduction to the Trades	40	50	90	3.5
EEST102	Material Applications	45	45	90	3.5
EEST103	Electronic and Electrical Principles	45	45	90	3.5
EEST104	Basic Electricity	45	45	90	3.5
EEST105*	Electrical Wiring Principles	45	45	90	3.5
EEST206*	Electrical Controls	40	50	90	3.5
EEST207	Computers and Networking	41	49	90	3.5
EEST208*	Fiber Optics, Telecommunication Systems & PLC	41	49	90	3.5
EEST209*	Security Systems, Access Control & CCTV Systems	45	45	90	3.5
EEST210*	Fire Alarm Systems	45	45	90	3.5
EEST211*	A/V, Home Theater and Satellite/Cable TV	45	45	90	3.5
EEST212*	System Integration	45	45	90	3.5
<b>Totals</b>		<b>522</b>	<b>558</b>	<b>1080</b>	<b>42.0</b>

**Note:** Course numbers and sequences are listed here for reference only. The actual delivery sequence of courses contained in this program may vary depending on individual campus scheduling. Courses identified as requiring a prerequisite delivery are marked with a single asterisk (\*), as noted in the course description.

The listing of credits is not meant to imply that credits can be transferred into college or other private career school programs. Transfer credits are at the sole discretion of the receiving school.

**Maximum Time Frame to Complete is 63.0 Semester Credits**

## **Course Descriptions**

### **EEST 101 INTRODUCTION TO THE TRADES**

Lecture: 40      Lab: 50      Total Hours: 90      Credits: 3.5

The student will be taught how to use basic information for electrical and electronic industries as well as some basic concepts used in performing the electrical and low voltage technician's skill-sets. Material covered includes basic safety, mathematical principles focused on whole numbers, fractions, measurement, decimals, percentages, and the metric system. Additionally, students will be taught how to use hand tools and power tools most commonly used the trades, i.e.: screwdrivers, tape measures, hand saws, drills, etc.

*Prerequisite(s): None*

### **EEST 102 – MATERIAL APPLICATIONS**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

The student will learn how to use knowledge of basic structural concepts of residential and commercial buildings, including wood and metal frame, brick and block, poured and prefabricated concrete, and structural steel and apply that to residential electrical and electronic system environments. Additionally, this course covers drills and bit types, and techniques used to drill through various construction materials. Discussion of fire and sound-rated walls, and suspended ceilings is also included. The student will learn how to use basic blueprint concepts, and the hardware and systems used by an electrical and electronics technician to mount and support boxes, receptacles, and other low voltage components. The student will learn how to use the various types of anchors and supports, their applications, and how to install them safely. Additionally, an overview of electrical raceways from source to destination provided. The student will learn how to use conduit types and bending techniques which completes the student's training in this course.

*Prerequisite(s): None*

### **EEST 103 – ELECTRONIC and ELECTRICAL PRINCIPLES**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course provides the student with a general introduction to the concepts used in Ohm's Law applied to DC series, parallel and combined circuits. This course also provides an introduction to concepts used in AC circuits. Topics include electrical theory, electromotive force, resistance, capacitance, inductance, impedance and power equations. Students will study Semiconductors and Integrated circuit theory with hands on lab time to reinforce the learning. Students will study schematic symbols and practice building circuits from schematic diagrams. Students also study appropriate application of proper diagnostic and maintenance procedures using electrical and electronic test equipment to include: meters, oscilloscopes, meg-ohm-meter, watt meters, frequency meters/generators, time domain reflectometers, continuity testers, recording instruments, and RF analyzers.

*Prerequisite(s): None*

### **EEST 104 – BASIC ELECTRICITY**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course introduces the student to the electrical trade and provides them with knowledge in the areas of Electrical safety and residential electrical services. It also introduces them to the National Electrical Code and how to find the applicable codes and requirements in the electrical trade. It further provides the student with knowledge in the areas of grounding and bonding of electrical systems; NEC regulations pertaining to grounding and bonding; equipment and devices used for grounding and bonding. Students will also learn about other types of equipment and devices used in the electrical and electronic trades.

*Prerequisite(s): None*

### **EEST105 – ELECTRICAL WIRING PRINCIPLES**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course will provide the student with a thorough understanding of components used in the electrical and electronic trades. Student will understand the functions of the various components of a motor control center and viewed from both a maintenance and troubleshooting standpoint. In addition, the electrical student will learn about different types of lamps, lighting fixtures, and related components. Students will also focus on basic guidelines and procedural information for receiving and storing, handling and installing lamps and lighting fixtures. The student will learn about (NEMA) National Electrical Manufacturers Association as they prepare to work with magnetic coils and relays, contacts and holding circuit

interlock and other structural features of solenoids, timers, starters and contactors. Students will also learn about fuses and circuit breakers for they provide protection to electrical conductors and equipment against abnormal conditions.

*Prerequisite(s): EEST 103, 104*

### **EEST 106 – ELECTRICAL CONTROLS**

Lecture: 40      Lab: 50      Total Hours: 90      Credits: 3.5

This course will provide the student with a thorough understanding and functions of the various components used in motor control systems. The student will be introduced to the maintenance and troubleshooting functions of motor controls systems. The student will also learn about the different types of devices and components used within motors controls systems. The course will also focus on basic guidelines and procedural information for receiving and storing, handling and installing lamps and lighting fixtures. The student will learn about (NEMA) National Electrical Manufacturers Association as they prepare to work with magnetic coils and relays, contacts and holding circuit interlock and other structural features of solenoids, timers, starters and contactors. The student will also learn about fuses and circuit breakers. They will understand how they provide protection to electrical conductors and equipment against abnormal conditions.

*Prerequisite(s): EEST 103, 104, 105*

### **EEST 207 – COMPUTERS AND NETWORKING**

Lecture: 41      Lab: 49      Total Hours: 90      Credits: 3.5

In this course, emphasis is placed on identifying and troubleshooting hardware and software components of the PC. Through hands-on projects that simulate real-life scenarios, students will apply concepts taught. Students will study computer applications in the low voltage industries. Application software installation and configuration will be presented during the course of study. Installation and configuration of specialized hardware components is part of the studies. In addition, the student will be able to network several computers together back to a main computer

*Prerequisite (s): None*

### **EEST 209 – FIBER OPTICS, TELECOMMUNICATION SYSTEMS and PLC**

Lecture: 41      Lab: 49      Total Hours: 90      Credits: 3.5

This course provides the student knowledge of the basic operation of telephone systems, types of system cables, cable color coding, cable connectors, and installation techniques in addition to identifying the types of data networks, test equipment, and procedures used in testing cables. The student will be familiar with Programmable Logic Controllers and programming them by uses of logic ladders. The student will use the proper procedure and technique to install fiber-optic cabling and support equipment, while describing or demonstrating the types of fiber-optic splicing and/or terminations to achieve an acceptable and "test verified" loss within a specified and acceptable range.

*Prerequisite(s): EEST 101, 103*

### **EEST 209 – SECURITY SYSTEMS, ACCESS CONTROL and CCTV SYSTEMS**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course is designed to provide the student with the knowledge and skills to install and troubleshoot nurse call and signaling systems, entry/access control systems, intrusion detection, security, and surveillance systems (included is CCTV system and key components of a CCTV system), Lighting, HVAC, Water, and Access systems. Students will learn the function and how to install and troubleshoot systems in the areas of nurse call, access control, security systems and intrusion detection, video surveillance, as well as lighting, HVAC, and water control systems.

*Prerequisite(s): EEST 101, 102, 103, 104, 105*

### **EEST 209 – FIRE ALARM SYSTEMS**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course provides the student with the knowledge and skills required to successfully, plan, install and problem-solve, both standard Fire Alarm systems and Programmable Fire Alarm systems. Students will be taught the proper methods and equipment to use in residential and industrial fire-detection applications. Proper wiring/cable selection, fire-detection equipment selection, and system layout/planning will be obtained in this course of study. Programming of Fire Alarm devices and systems will be introduced. Theory of typical Fire Alarm software will be presented in this course of study. Hands-on practices of the software applications are included in the course of study.

*Prerequisite(s): EEST 101, 102, 103, 104, 105*

### **EEST 104 – A/V HOME THEATRE and SATELILITE/CABLE TV**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course is designed to provide the student with the knowledge and skills required to install and troubleshoot rack systems, system integration, and residential systems integration. The students will be taught component function and how to install complete systems racks, residential automation systems. The students will be taught system commissioning and how to train client based systems. In addition, they will learn finish phase testing along with maintenance and repair.

*Prerequisite(s): EEST 101, 102, 103, 104, 105*

### **EEST 105 – SYSTEM INTEGRATION**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course is designed to prepare the student to take the ESPA Exam as well as provide the student with the knowledge and skills required to install and troubleshoot integrated systems. The students will be taught component function and how the skills and technologies learned in previous modules can be integrated together and automated.

*Prerequisite(s): EEST 101, 102, 103, 104, 208, 209, 211*

# EEST410A Electrical and Electronic Systems Technology Service Management

**COLUMBIA ASSOCIATE OF APPLIED SCIENCE DEGREE PROGRAM**

**CIP CODE: 46.0302    SOC Code 47-2111.00**

**Total Instructional Hours: 1395**

**Total Program Credits: 63 Semester Credits**

**Program Length: Day and Evening – Approximately 92 weeks (including holidays and scheduled breaks)**

## **Program Objective:**

This program is designed to provide the essential skills and knowledge for the installation, troubleshooting, repair, and maintenance of commercial and residential entertainment, security, monitoring, and telecommunications systems. Students learn to install cable support structures; laying out and preparing pathways for wiring and cables; installing, securing, testing, and termination of wiring and cables both copper and fiber optic; program digital components and access controls to perform their designated tasks; install and set up media management systems; and perform system commissioning and user training of audio, video, and data systems. The program also prepares students on the essential skills and knowledge needed for entry-level residential electrician work. Students will train on the installation, service and maintenance areas of the residential electrical industry.

Upon completion of this program, graduates can meet the minimum requirements needed to be qualified as an entry-level technician in the residential and/or commercial telecommunications, fire alarm, intrusion detection, nurse call and signaling, entertainment, audio/video/data, and energy management systems. Student can also qualify as entry-level residential electrician's apprentice.

For Master electrician exam, the applicant shall not show less than seven (7) years of experience preceding the date of the application, under the direction and supervision of a master electrician, three (3) years during which the applicant supervised or was actively in charge of electrical installation work. The Board may credit not more than three (3) years for formal course study or professional training in electrical installation, where applicable. Students will be required to complete out-of-class assignment in each course. Student will be required to complete out-of-class assignment in each course.

## **Program Content:**

Course Number	Course Title	Lecture Hours	Lab/Shop Hours	Total Contact Hours	Total Credits
EEST101	Introduction to the Trades	40	50	90	3.5
EEST102	Material Applications	45	45	90	3.5
EEST103	Electronic and Electrical Principles	45	45	90	3.5
EEST104	Basic Electricity	45	45	90	3.5
EEST105*	Electrical Wiring Principles	45	45	90	3.5
EEST206*	Electrical Controls	40	50	90	3.5
EEST207	Computers and Networking	41	49	90	3.5
EEST208*	Fiber Optics, Telecommunication Systems & PLC	41	49	90	3.5
EEST209*	Security Systems, Access Control & CCTV Systems	45	45	90	3.5
EEST210*	Fire Alarm Systems	45	45	90	3.5
EEST211*	A/V, Home Theater and Satellite/Cable TV	45	45	90	3.5
EEST212*	System Integration	45	45	90	3.5
<b>Totals Core courses</b>		<b>837</b>	<b>558</b>	<b>1080</b>	<b>42</b>

## **General Education Courses**

Course Number	Course Title Section	Total Credits
GEN190	English Composition I	3.0
GEN180	College Algebra	3.0
GEN160	Psychology	3.0
GEN130	Introduction to Critical Thinking	3.0

GEN292	Speech Communications	3.0
GEN162	American Government	3.0
GEN150	Environmental Science	3.0
<b>Total Core and General Education</b>		<b>63 Semester Credit Hours</b>
<b>Transitional Courses**</b>		
<b>Course Number</b>	<b>Course Title Section</b>	<b>Total Credits</b>
GEN099	Foundations of English	3.0
GEN089	Basic of Mathematics	3.0

**Note:** Course numbers and sequences are listed here for reference only. The actual delivery sequence of courses contained in this program may vary depending on individual campus scheduling. Courses identified as requiring a prerequisite delivery are marked with a single asterisk (\*), as noted in the course description.

**The listing of credits is not meant to imply that credits can be transferred into college or other private career school programs. Transfer credits are at the sole discretion of the receiving school.  
Maximum Time Frame to Complete is 94.5 Semester Credits**

**\*\*Transitional Courses**

Students with an SAT score of 500 in English and 500 in Math or ACT scores of 17 or higher in the same subjects and a "B" in high school English and /or in mathematics are qualified to be placed into college level English and mathematics courses.

All other associate degree students will be required to take COMPASS, an academic competency assessment, to determine their level of competency in college level writing and college level general mathematics. Students whose scores fall below the accepted level will be required to complete one or two Transitional Studies courses in English and mathematics prior to taking any college level English and math courses. These courses will be computed into the student's overall cumulative grade point average, but will not be applied toward graduation requirements.



## ***Course Descriptions***

### **BEST 101 – INTRODUCTION TO THE TRADES**

Lecture: 40      Lab: 50      Total Hours: 90      Credits: 3.5

The student will be taught how to use basic information for electrical and electronic industries as well as some basic concepts used in performing the electrical and low voltage technician's skill-sets. Material covered includes basic safety, mathematical principles focused on whole numbers, fractions, measurement, decimals, percentages, and the metric system. Additionally, students will be taught how to use hand tools and power tools most commonly used the trades, i.e.: screwdrivers, tape measures, hand saws, drills, etc.

*Prerequisite(s): None*

### **BEST 102 – MATERIAL APPLICATIONS**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

The student will learn how to use knowledge of basic structural concepts of residential and commercial buildings, including wood and metal frame, brick and block, poured and prefabricated concrete, and structural steel and apply that to residential electrical and electronic system environments. Additionally, this course covers drills and bit types, and techniques used to drill through various construction materials. Discussion of fire and sound-rated walls, and suspended ceilings is also included. The student will learn how to use basic blueprint concepts, and the hardware and systems used by an electrical and electronics technician to mount and support boxes, receptacles, and other low voltage components. The student will learn how to use the various types of anchors and supports, their applications, and how to install them safely. Additionally, an overview of electrical raceways from source to destination provided. The student will learn how to use conduit types and bending techniques which completes the student's training in this course.

*Prerequisite(s): None*

### **BEST 103 – ELECTRONIC AND ELECTRICAL PRINCIPLES**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course provides the student with a general introduction to the concepts used in Ohm's Law applied to DC series, parallel and combined circuits. This course also provides an introduction to concepts used in AC circuits. Topics include electrical theory, electromotive force, resistance, capacitance, inductance, impedance and power equations. Students will study Semiconductors and Integrated circuit theory with hands on lab time to reinforce the learning. Students will study schematic symbols and practice building circuits from schematic diagrams. Students also study appropriate application of proper diagnostic and maintenance procedures using electrical and electronic test equipment to include: meters, oscilloscopes, meg-ohm-meter, watt meters, frequency meters/generators, time domain reflectometers, continuity testers, recording instruments, and RF analyzers.

*Prerequisite(s): None*

### **BEST 104 – BASIC ELECTRICITY**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course introduces the student to the electrical trade and provides them with knowledge in the areas of Electrical safety and residential electrical services. It also introduces them to the National Electrical Code and how to find the applicable codes and requirements in the electrical trade. It further provides the student with knowledge in the areas of grounding and bonding of electrical systems; NEC regulations pertaining to grounding and bonding; equipment and devices used for grounding and bonding. Students will also learn about other types of equipment and devices used in the electrical and electronic trades.

*Prerequisite(s): None*

### **BEST 105 – ELECTRICAL WIRING PRINCIPLES**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course will provide the student with a thorough understanding of components used in the electrical and electronic trades. Student will understand the functions of the various components of a motor control center and viewed from both a maintenance and troubleshooting standpoint. In addition, the electrical student will learn about different types of lamps, lighting fixtures, and related components. Students will also focus on basic guidelines and procedural information for receiving and storing, handling and installing lamps and lighting fixtures. The student will learn about (NEMA) National Electrical Manufacturers Association as they prepare to work with magnetic coils and relays, contacts and holding circuit interlock and other structural features of solenoids, timers, starters and contactors. Students will also learn about fuses and circuit breakers for they provide protection to electrical conductors and equipment against abnormal conditions.

*Prerequisite(s): EEST 103, 104.*

#### **EEST 105 – ELECTRICAL CONTROLS**

Lecture: 40      Lab: 50      Total Hours: 90      Credits: 3.5

This course will provide the student with a thorough understanding and functions of the various components used in motor control systems. The student will be introduced to the maintenance and troubleshooting functions of motor controls systems. The student will also learn about the different types of devices and components used within motors controls systems. The course will also focus on basic guidelines and procedural information for receiving and storing, handling and installing lamps and lighting fixtures. The student will learn about (NEMA) National Electrical Manufacturers Association as they prepare to work with magnetic coils and relays, contacts and holding circuit interlock and other structural features of solenoids, timers, starters and contactors. The student will also learn about fuses and circuit breakers. They will understand how they provide protection to electrical conductors and equipment against abnormal conditions.

*Prerequisite(s): EEST 103, 104, 105*

#### **EEST 107 – COMPUTERS AND NETWORKING**

Lecture: 41      Lab: 49      Total Hours: 90      Credits: 3.5

In this course, emphasis is placed on identifying and troubleshooting hardware and software components of the PC. Through hands-on projects that simulate real-life scenarios, students will apply concepts taught. Students will study computer applications in the low voltage industries. Application software installation and configuration will be presented during the course of study. Installation and configuration of specialized hardware components is part of the studies. In addition, the student will be able to network several computers together back to a main computer

*Prerequisite (s): None*

#### **EEST 108 – FIBER OPTICS, TELECOMMUNICATION SYSTEMS and PLC**

Lecture: 41      Lab: 49      Total Hours: 90      Credits: 3.5

This course provides the student knowledge of the basic operation of telephone systems, types of system cables, cable color coding, cable connectors, and installation techniques in addition to identifying the types of data networks, test equipment, and procedures used in testing cables. The student will be familiar with Programmable Logic Controllers and programming them by uses of logic ladders. The student will use the proper procedure and technique to install fiber-optic cabling and support equipment, while describing or demonstrating the types of fiber-optic splicing and/or terminations to achieve an acceptable and "test verified" loss within a specified and acceptable range.

*Prerequisite(s): EEST 101, 103,*

#### **EEST 109 – SECURITY SYSTEMS, ACCESS CONTROL and CCTV SYSTEMS**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course is designed to provide the student with the knowledge and skills to install and troubleshoot nurse call and signaling systems, entry/access control systems, intrusion detection, security, and surveillance systems (included is CCTV system and key components of a CCTV system), Lighting, HVAC, Water, and Access systems. Students will learn the function and how to install and troubleshoot systems in the areas of nurse call, access control, security systems and intrusion detection, video surveillance, as well as lighting, HVAC, and water control systems.

*Prerequisite(s): EEST 101, 102, 103, 104, 105*

#### **EEST 110 – FIRE ALARM SYSTEMS**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course provides the student with the knowledge and skills required to successfully, plan, install and problem-solve, both standard Fire Alarm systems and Programmable Fire Alarm systems. Students will be taught the proper methods and equipment to use in residential and industrial fire-detection applications. Proper wiring/cable selection, fire-detection equipment selection, and system layout/planning will be obtained in this course of study. Programming of Fire Alarm devices and systems will be introduced. Theory of typical Fire Alarm software will be presented in this course of study. Hands-on practices of the software applications are included in the course of study.

*Prerequisite(s): EEST 101, 102, 103, 104, 105*

**EEST241 – A/V HOME THEATRE and SATELLITE/CABLE TV**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course is designed to provide the student with the knowledge and skills required to install and troubleshoot rack systems, system integration, and residential systems integration. The students will be taught component function and how to install complete systems racks, residential automation systems. The students will be taught system commissioning and how to train client based systems. In addition, they will learn finish phase testing along with maintenance and repair.

*Prerequisite(s): EEST 101, 102, 103, 104, 105,*

**EEST212 – SYSTEM INTEGRATION**

Lecture: 45      Lab: 45      Total Hours: 90      Credits: 3.5

This course is designed to prepare the student to take the ESPA Exam as well as provide the student with the knowledge and skills required to install and troubleshoot integrated systems. The students will be taught component function and how the skills and technologies learned in previous modules can be integrated together and automated.

*Prerequisite(s): EEST 101, 102, 103, 104, 208, 209, 211*

**GEN099 Foundations of English**

3.0 Credits

This course is designed to give students guided practice in the fundamental skills they will need to complete college-level reading and writing assignments. Mastery and review of Basic English concepts, essential to successful college and work experience, will be emphasized throughout the course. Students will apply their learning to a variety of writing activities that emphasize the development of paragraphs and essays.

***Prerequisite: None***

**GEN089 Basic Mathematics**

3.0 Credits

This course focuses on concepts and applications of arithmetic, including whole numbers, fractions, ratios, proportions, the decimal system, and percent's. Brief introductions to algebra, formulas, algebraic expressions, and linear equations are also included. Special emphasis is placed on the application of basic math skills to common workplace problems and real-life situations.

***Prerequisite: None***

**GEN096 English Composition I**

3.0 Credits

Students develop written communication skills, with emphasis placed on the principles of effective communication which includes understanding the writing process, analysis of readings, as can be applied personally and professionally.

***Prerequisite: Placement score above minimum level or GEN099.***

**GEN292 Speech Communication**

3.0 Credits

This course will enhance the student's understanding and appreciation of the uses of oral and written communication and will teach the skills needed to write and speak effectively in a variety of situations.

***Prerequisite: None***

**GEN089 College Algebra**

3.0 Credits

This course focuses on algebraic concepts essential for success in the workplace and other courses. Using real world examples and applications, students practice fundamental operations with number systems, formulas, algebraic expressions and linear equations. This course also explores problems involving factoring, inequalities, exponents, radicals, linear equations, functions, quadratic equations and graphs. Skills for success in mathematics will be emphasized.

***Prerequisite: Placement score above minimum level or GEN089.***

**GEN150 Introduction to Critical Thinking**

3.0 Credits

This course presents students with techniques to develop their critical thinking skills. Topics include the six sequential steps of critical thinking, the importance of language, ambiguity, structure of arguments and creative problem solving. Upon successful completion of this course students should be able to demonstrate an improvement in their ability to apply critical thinking skills to real world situations.

**Prerequisite: None**

**GEN150 Environmental Science**

3.0 Credits

This course is designed to provide students with a basic scientific overview of how nature works and how things in nature are interconnected. This course explores the study of the earth's natural resources. Topics include the study of how air, water, soil, natural energy, and the minerals are critical and related parts of the earth's interconnected systems.

**Prerequisite: None**

**GEN160 Psychology**

3.0 Credits

This course introduces human behavior. It includes the study of the theories and concepts of psychology including the scope of psychology, biological foundations and the brain, sensation, perception, motivation, personality, learning/memory, emotion, states of consciousness, personality theories, cognition, life-span development, and applied psychology.

**Prerequisite: None**

**GEN162 American Government**

3.0 Credits

This course is designed to be an exploration of how American government formed in its constitutional roots and how it continues to develop. Topics will include how government is organized, its influencing factors, and the development of public policy.

**Prerequisite: None**

# Syllabus Syllabus

## ***EEST-101 Introduction to the Trades***

### ***Instructor Information***

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

The student will be taught how to use basic information for electrical and electronic industries as well as some basic concepts used in performing the electrical and low voltage technician's skill-sets. Material covered includes basic safety, mathematical principles focused on whole numbers, fractions, measurement, decimals, percentages, and the metric system. Additionally, students will be taught how to use hand tools and power tools most commonly used the trades, i.e.: screwdrivers, tape measures, hand saws, drills, etc.

**LEARNING OBJECTIVES**

- The students will become knowledgeable of all the electrical related trade areas, specialty crafts, and job descriptions that encompass the electrical and Electronics career field and what skills, knowledge, and abilities are necessary and required in those areas.
- The student will be introduced to hand tools and power tools relating to the electrical Electronics field and will become proficient in their use, maintenance, and field applications by participating in course work and practical exercises. The student will operate the tools using safety guidelines established in the course, as well as adhering to general safety procedures & guidelines for program and trade related activities.
- The students will use math principles and techniques in the performance of program tasks, exercises, analysis, measuring, testing, and troubleshooting, while applying these principles to the trade areas of electrical construction, and equipment installation.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

90 Contact Hours (40 Lectures / 50 Labs)

**CREDIT HOURS**

3.5 semester credit hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

Core Curriculum – Introductory Craft Skills – Trainee Guide  
National Center for Construction Education and Research  
Pearson Prentice Hall; 2015; Flesch-Kincaid Reading Grade Level: 9.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS****Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class

**GRADING POLICY****Grade Scale**

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A

# EEST-101 Introduction to the Trades

## Syllabus

Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course.	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A

A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program GPA of 2.0

### ATTENDANCE POLICY

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

### REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make-up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the



special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**DAILY OUTLINE****Intro to the Trades**

- Describe the importance of codes and standards and explain how they affect the work of the electronic systems technician
- Understand the role played by industry associations and be able to identify key associations.
- Explain and demonstrate professional communication with the customer
- State the rules for professionalism and ethical conduct

**Basic Safety**

- Explain the idea of a safety culture and its importance in the construction crafts
- Explain the role of OSHA in job-site safety
- Define safe work procedures to use around electrical hazards
- Discuss impact of accident cost for the employer and ultimately insurance companies
- Explain Hazardous materials on the job site and the purpose MSDS
- Demonstrate the use and care of appropriate personal protective equipment (PPE)
- How to recognize job site hazardous conditions
- Identify other construction hazards on the job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires

**Hand Tools**

- Recognize and identify some of the basic hand tools and their proper uses in the construction trades
- Visually inspect hand tools to determine if they are safe to use
- Identification and proper use of hammers and why striking one hammer with another could have bad consequences
- Identify and demonstrate how to select the correct tool and use it properly

**Power Tools**

- Identifying various power tools, using power tools properly.
- Explain how to maintain power tools properly.
- Identifying various power tools, using power tools properly.
- Explain how to maintain power tools properly (continued)
- Identity the right tool for the right job
- Demonstrate proper use various power tools
- Identity the right tool for the right job
- Demonstrate proper use various power tools

**Power tools and Handling Equipment Material**

- Define a load.
- Pre-task plan prior to moving a load.
- Operating Equipment Handling Material
- Proper use of material-handling techniques
- Demonstrate appropriate material handling of a given task.

**Construction Math**

- Understanding construction math problems add, subtract, multiply and divide. Convert fractions to decimals

- Understanding construction math problems convert decimals to percentages
- Interpret information both verbal and written skills

**Basic Communication Skills**

- Communicating effectively on the job using electronic devices
- Communicate with other students talking in technical terms.

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## *EEST-102 Material Applications*

### *Instructor Information*

Name:

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Phone Number:

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Email:

\_\_\_\_\_

Office Hours:

\_\_\_\_\_

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

The student will learn how to use knowledge of basic structural concepts of residential and commercial buildings, including wood and metal frame, brick and block, poured and prefabricated concrete, and structural steel and apply that to residential electrical and electronic system environments. Additionally, this course covers drills and bit types, and techniques used to drill through various construction materials. Discussion of fire and sound-rated walls, and suspended ceilings is also included. The student will learn how to use basic blueprint concepts, and the hardware and systems used by an electrical and electronics technician to mount and support boxes, receptacles, and other low voltage components. The student will learn how to use the various types of anchors and supports, their applications, and how to install them safely. Additionally, an overview of electrical raceways from source to destination provided. The student will learn how to use conduit types and bending techniques which completes the student's training in this course.

**LEARNING OBJECTIVES**

- For a given construction task, the students will identify, select, plan, and install the proper fastener and/or anchor mechanism to accomplish the objective, while utilizing the proper tools, installation procedure, and application for the materials involved.
- Using knowledge imparted by the course, the students will identify the types, composition, construction methods, and applications of construction materials used in floors, walls, ceilings, and other components of residential and commercial buildings. The appropriate tools and procedures will be identified to use with the various materials and tasks, as well as installation of applicable fastener and anchors.
- The student will be able to describe the various types of cable trays, raceways, conduits, and wire-ways, while selecting the applicable sizes, mountings, routing, and installation method for the surface, wall/ceiling composition, and equipment used in the application.
- Students will measure, cut, manipulate, and hand bend conduit materials to an accurate degree required, so as to be able to fit and fabricate the components into a predetermined assembly, exercise, or project.
- Construction drawings will be utilized for projects and exercises with a working understanding of terms, components, and symbols, sufficient for proficiency and utilization

**PREREQUISITE(S)**

*None*

**CONTACT HOURS**

90 Contact Hours (45 Lecture / 45 Lab)

**CREDIT HOURS**

3.5 semester credit hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect with Pearson eText-Trainee Access Card-for Electrical Level 1, 7/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2014 NEC Revised; Flesch-Kincaid Reading Grade Level: 9.0

NCCERconnect with Pearson eText-Trainee Access Card-for Electrical Level 2, 7/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2014 NEC Revised; Flesch-Kincaid Reading Grade Level: 9.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS****Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
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Professionalism	15%
Midterm Exam	10%
Final Exam	10%

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

**GRADING POLICY**Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
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77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
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59 and below	F	Failing Work	0.0
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Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point	N/A

## Average

A student earning a grade of **D-** or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of **F** has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program **GPA of 2.0**

**ATTENDANCE POLICY**

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced. Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

**REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of **D-** or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**DAILY OUTLINE****Electrical Material Application**

- Describe The Importance of being able to read and understand the NEC (National Electrical Codes)
- Understand and different types of construction drawings, as it provides information for electrical drawings
- Identify commercial and residential construction materials. Describe electrical raceways, fittings and devices. View differences between conduit bending and hand bending of conduit.

**Basic Electrical Construction Drawings**

- Explain the basic layout of a set of construction drawing.
- Describe types of information included in the title block of a construction drawings
- Identify the types of lines used on a construction drawings
- Explain the types of scales used in drawings, use architectural scale, state actual dimensions of a given print.
- Interpret electrical drawings, including site plans, floor plans and electrical power plans
- Interpret equipment schedules found on electrical drawings
- Explain Lighting Floor plan and Branch Circuit layout and Power Riser diagrams
- Explain how and why Specifications are written

**Raceways and Fittings**

- Identify and select various types and sizes of raceways and fittings for a given application

- Identify the most common type of rigid nonmetallic conduit
- Identify various methods used to fabricate (join) and install raceways systems
- Identify uses permitted for selected raceways
- Demonstrate the importance of using the NEC as a guide to install wireways
- Demonstrate how to install cable trays in a specific location

**Fasteners and Anchors**

- Identify various types of fasteners and anchors for a given application
- Demonstrate how to install various types fasteners and anchors with different wall construction

**Cable Tray**

- Describe the components that make up a cable tray assembly
- Explain the methods used to hang and secure cable tray
- Explain the NEC requirements for cable tray installations
- Select the required fittings to ensure equipment grounding continuity in cable tray systems

**Device Boxes**

- Describe the different types of nonmetallic and metallic boxes
- Calculate the NEC fill requirements for boxes under 100 cubic inches

**Hand Bending of Conduit**

- Identify the methods for hand bending and installing conduit
- Determine conduit bends
- Make 90° bends and back-to-back bends
- Make Offsets, kicks and saddles
- Describe the process of conduit bending using power tools
- Identify all parts of electric and hydraulic benders that form various conduit bends
- Explain the requirements of the National Electrical Code (NEC®) for conduit bending
- Compute the radius, degrees in bend, developed length and gain for 90° bends
- Use segment bending technique (pump method) to obtain 90° bends
- Perform concentric bends using two or more parallel runs
- Perform Offsets bends using the hydraulic bender
- Perform concentric offsets and create saddle bends

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016



# Syllabus Syllabus

## ***EEST-103 Electronic and Electrical Principles***

### ***Instructor Information***

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course provides the student with a general introduction to the concepts used in Ohm's Law applied to DC series, parallel and combined circuits. This course also provides an introduction to concepts used in AC circuits. Topics include electrical theory, electromotive force, resistance, capacitance, inductance, impedance and power equations. Students will study Semiconductors and Integrated circuit theory with hands on lab time to reinforce the learning. Students will study schematic symbols and practice building circuits from schematic diagrams. Students also study appropriate application of proper diagnostic and maintenance procedures using electrical and electronic test equipment to include: meters, oscilloscopes, meg-ohm-meter, watt meters, frequency meters/generators, time domain reflectometers, continuity testers, recording instruments, and RF analyzers.

**LEARNING OBJECTIVES**

- The student will be able to demonstrate and follow safe working procedures when performing related exercises in the course and in a construction environment. OSHA's role in job safety will be understood and referenced, as well as using the practical safety procedures for lockout/tagout, personal protection gear, grounding, respiratory protection, confined spaces, fall protection, and electrical hazard identification.
- By the end of this course, the student should be able to analyze both DC and AC circuits using Ohm's Law, Kirchoff's Laws, Reactance formulas, and vector analysis.
- Student will be able to explain the operation of basic Volt Ohmmeter and demonstrate the proper use of both an Analog VOM and a Digital Multimeter.
- Student will be able to identify electronic components and their schematic equivalent. Student will be able to build circuits using schematics.
- Student will be able to explain the difference between conductors, insulators and semiconductors.
- Student will be able to build and explain semiconductor circuits as well as being able to identify different semiconductor devices such as diodes, Triacs, LEDs, SCRs, transistors.
- Student will be able to identify a microprocessor and applicable pin numbers
- Student will be able to explain the purpose of logic gates.
- Identify and describe operation of photocell and solar cell
- Explain the operation and use of specialized test equipment used in checkout and trouble shooting of electronic equipment, cables and cabling systems
- Select and demonstrate the use of the correct item of test equipment to troubleshoot a circuit
- Use an oscilloscope to measure various waveforms

**PREREQUISITE(S)**

None

**CONTACT HOURS**

90 Contact Hours (45 Hours Lecture / 45 Hours Lab)

**CREDIT HOURS**

3.5 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect with Pearson eText-Trainee Access Card-for Electrical Level 1, 7/e  
National Center for Construction Education and Research  
Pearson Prentice Hall; 2014 NEC Revised; Flesch-Kincaid Reading Grade Level: 9.0

NCCERconnect with Pearson eText - Trainee Access Card -for Electrical Level 2, 7/e  
National Center for Construction Education and Research  
Pearson Prentice Hall; 2014 NEC Revised; Flesch-Kincaid Reading Grade Level: 9.0

**INSTRUCTIONAL METHODS**

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This course is delivered via the Residential model.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS****Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

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### GRADING POLICY

#### Grade Scale

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95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
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74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
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Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
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Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A

Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A
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#### **DAILY OUTLINE**

##### **Electrical Circuits**

- Define Voltage and identify the many ways in which it can be produced
- Explain the Atomic theory, construction and behavior of atoms transfer its electrons to create current flow
- Explain the difference between conductors and insulators and magnetism
- Demonstrate how electrical power is generated and distributed
- Describe characteristics and relationships between voltage, current and resistance
- Explain OHM'S Law and schematic representation using resistors and color codes

**Electrical Theory**

- Explain the fundamental concept used to analyze more complex series circuits, parallel circuits and combination series-parallel circuits
- Identify and use OHM'S Law rules in a series circuit.
- Use OHM'S Law rules in a series circuit.
- Calculate series schematics using Kirchhoff's Voltage drop and current Law
- Explain expanded OHM'S Law rules include Power with respect voltage, current and resistance in a series circuit
- Calculate series schematics using Kirchhoff's Voltage drop and current Law
- Explain parallel circuit OHM'S Law rules
- Calculate parallel schematics using Kirchhoff's Voltage drop and current Law

**Semi-conductors and Integrated Circuits**

- Explain the Atomic theory, construction and behavior of atoms in semi-conductors
- Discuss logic gates
- Explain and Build a bridge rectifier and view the results
- Build SCR circuit, practice identifying a microprocessor and pin numbers

**Electrical Test Equipment**

- Explain and describe the operation of the following equipment: Voltmeter, Ohmmeter and Clamp-on ammeter
- Build and measure AC series and parallel using Ohm's Law Graph
- Describe and Practice measuring AC/DC voltages
- Review megohmmeter and motor and phase rotation testers

**Test Equipment digital multimeter**

- Discuss features available on a digital multimeter
- Review how to avoid hazard or meter damage
- Demonstrate how the cable toner generates tone to find hidden conductors
- Explain how cable certification testers are used to verify cable performance requirements

**Alternating Current**

- Calculate Peak and Effective voltage or current values in an AC waveform
- Introduction to sine wave generation
- Explain RMS amplitude
- Demonstrate how meters used in AC circuit indicate a value called effective value, the comparison between AC and DC is heat.
- Explain this characteristic opposes the change of current flow
- Explain and demonstrate the ability of a capacitor can store a charge
- Describe the transformer construction and transformer action
- Discuss turns and voltage ratio and types of transformers
- Complete review questions at the end of chapter, be prepared to discuss

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016



# Syllabus Syllabus

## ***EEST-104 Basic Electricity***

### ***Instructor Information***

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course introduces the student to the electrical trade and provides them with knowledge in the areas of Electrical safety and residential electrical services. It also introduces them to the National Electrical Code and how to find the applicable codes and requirements in the electrical trade. It further provides the student with knowledge in the areas of grounding and bonding of electrical systems; NEC regulations pertaining to grounding and bonding; equipment and devices used for grounding and bonding. Students will also learn about other types of equipment and devices used in the electrical and electronic trades.

**LEARNING OBJECTIVES**

- The student will be able to apply and explain the purpose, requirements, shielding, components, and locations of grounding functions, as they apply to electrical equipment, telecommunications equipment, different building environments, and AC & DC systems.
- Solid state electronic systems and their components will be described and identified by the students, enabling them to better install, diagnose, and construct low voltage equipment and applications, which utilize these integrated systems.
- The students will identify and distinguish between "Codes" versus "Standards", relate their relevance to the EST trade areas, use the NEC, and apply them accordingly in the course exercises and equipment installations.
- The student will be able to explain the basic layout of a blueprint, identify the types of lines & symbols, understand the scales, read the equipment schedules, and interpret the electrical drawings as they apply to site plans, floor plans, and equipment installations.
- Provides information and detailed instructions for selecting, installing, and testing connectors and other terminating devices on the various cables used in low-voltage work, including telecommunications, video and audio, and fiber optics.
- Provides an overview of the types of cable used for various low-voltage installations. Also covers the methods used to select the proper size and type of cable for a typical installation
- Describe the apprenticeship and electrical training process as well as various career paths and opportunities in the electrical field
- Recognize safe working practices in the construction environment, how electrical shock occur and the effects of electrical accidents
- Explain the role of the NEC (National Electrical Code) in residential wiring
- Calculate the size of load centers and Service conductors
- Explain the grounding requirements of a residential electric service
- Explain the types and purposes of equipment grounding conductors
- Explain the purpose of ground fault circuit interrupters and tell why they must be installed

- Describe the installation rules for electrical systems around swimming pools, spas, and hot tubs and installing electric space heating and HVAC equipment

**PREREQUISITE(S)**

*None*

**CONTACT HOURS**

90 Contact Hours (45 Lecture / 45 Lab)

**CREDIT HOURS**

3.5 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect with Pearson eText-Trainee Access Card-for Electrical Level 1, 7/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2014 NEC Revised; Flesch-Kincaid Reading Grade Level: 9.0

**INSTRUCTIONAL METHODS**

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### GRADING POLICY

#### Grade Scale

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Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A

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#### DAILY OUTLINE

##### Orientation to Electrical Trade

- Describe the apprenticeship and electrical training process.
- Describe the roles of the residential, commercial and the industrial electrician
- Describe various career paths and opportunities in the electrical field.
- Explain the role of the electrical maintenance technician for commercial and industrial facilities
- Explain the responsibilities and aptitudes of an electrician.

**Electrical Safety**

- Recognize safe working practices in the construction environment
- Discuss company safety policies and OSHA standards
- Identify the types, classes and safety requirements of rubber protective equipment
- Explain electrical safety issues concerning lockout / tagout procedures, confined spaces, and fall protection systems

**Lesson Title: Introduction to NEC**

- Explain the purpose and history of the NEC
- Describe the layout of the NEC
- Use NEC article 90 to define the scope of the NEC
- Discuss and examine the terms and definitions used in the NEC
- Discuss articles and codes common to the industry
- Identify how to navigate the NEC and use specifications for various electrical installations

**Residential Electrical Service**

- Explain the role of the NEC (National Electrical Code) in residential wiring
- Discuss sizing of load centers, Service, and conductors
- Explain the grounding requirements of a residential electric service
- Explain the purpose of ground fault circuit interrupters and tell why they must be installed
- Explain the differences between overhead service drop and underground service lateral
- Explain terminologies used such as “service entrance equipment”
- Describe the installation rules for electrical systems around swimming pools, spas, and hot tubs
- Explain the term load center or panelboard normally located at the service entrance
- Describe the rules for installing electric space heating and HVAC equipment
- Explain the differences between metal-clad (type MC) and nonmetallic-sheathed cable

**Grounding and Bonding**

- Explain the purpose of grounding and bonding and the scope of the NEC Article 250
- Explain the function of the grounding electrode
- Use NEC Table 250.122 to size the equipment grounding conductor for raceways and equipment
- Size the main bonding jumper for a service utilizing multiple service disconnects

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***EEST-105 Electrical Wiring Principles***

### ***Instructor Information***

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course will provide the student with thorough understanding of the functions of the various components of a motor control center and viewed from both a maintenance and troubleshooting standpoint. In addition, the electrical student will learn about different types of lamps, lighting fixtures, and related components, it also focuses on basic guidelines and procedural information for receiving and storing, handling and installing lamps and lighting fixtures. The student will learn about (NEMA) National Electrical Manufacturers Association as they prepare to work with magnetic coils and relays, contacts and holding circuit interlock and other structural features of solenoids, timers, starters and contactors. And finally the technician will learn about fuses and circuit breakers for they provide protection to electrical conductors and equipment against abnormal conditions.

**LEARNING OBJECTIVES**

- The electrical student will become knowledgeable of cable markings, to describe the insulation and jacket material, conductor size and type.
- The students will prepare cable ends for terminations and splices and connect using lugs or connectors
- The students will become knowledgeable of the different types of nonmetallic and metallic pull and junction boxes
- Explain to the electrical student the importance of good communication during a cable pulling operation

**PREREQUISITE(S)**

*EEST 103, 104*

**CONTACT HOURS**

90 Contact Hours (45 Hours Lecture / 45 Hours Lab)

**CREDIT HOURS**

3.5 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

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Override			
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**DAILY OUTLINE****Conductors and Cables**

- From the cable markings, describe the insulation and jacket materials, conductor size and type, number of conductors, temperature rating, voltage rating, and permitted uses.
- Determine the allowable ampacity of a conductor for a given application
- Describe conductivity- the ease or difficulty of a conductor to conduct an electric current
- Identify the NEC requirements for color coding of conductors
- Determine the guidelines for use of SE (Service Entrance) USE (underground service entrance) according to the NEC Article 338
- Explain pulling equipment and feeding conductors into conduits
- Install conductors in a raceway system, using lubricants and finally termination

**Lesson Title: Wire Ratings**

- Identify critical factors in selecting conductors to operate at its maximum temperature
- Identify the cable markings on nonmetallic-sheathed cable

**Conductor terminations and splices**

- Describe how to make a good conductor termination
- Identify how to strip small conductors, power cables and large conductors including control and signal cables
- Prepare cable ends for terminations and splices and connect using lugs or connectors
- Demonstrate the use of NEC section 110.14 in reference to terminations and splices under 600V
- Identify NEC classifications and ratings for Fire Alarm, Instrumentation and Control Cables
- Review guidelines for use of compression and crimping tools and connectors
- Describe the procedure for bending and training cables and conductors
- Identify the NEC termination requirements overcurrent protection from upstream devices and within the equipment

**Taping Electrical joints**

- Identify the various types of electrical insulating tapes
- Describe the general procedure for taping a splice or joint

**Pull and Junction boxes**

- Describe the different types of nonmetallic and metallic pull and junction boxes
- Discuss considerations for installing boxes in damp and wet locations
- Define raintight, waterproof, and weatherproof
- Properly select, install, and support pull and junction boxes and their associated fittings
- Describe the National Electrical Code (NEC) regulations governing pull and junction boxes
- Describe the different types of conduit bodies and the letters used to identify them.
- Discuss the NEC requirements for handholes and handhole enclosures
- Understand the NEMA and IP classifications for pull and junction boxes
- Describe the function of fittings in raceway systems
- Discuss the threaded fittings used with RMC, IMC, and aluminum conduit
- Describe how to use a knockout hole punch to make a hole for the conduit connection
- Discuss battery-powered and hydraulic knockout kits

**Conductor Installations**

- Explain the importance of good communication during a cable-pulling operation
- Understand that planning any wire-pulling installation cannot be over-stressed
- Explain how mandrels, swabs, and brushes are used to prepare conduit for conductors
- Introduce the planning and tasks required prior to pulling cable and the equipment that is generally needed for an installation
- Properly install a pull line for a cable-pulling operation
- Explain how and when to support conductors in vertical conduit runs
- Describe the installation of cables in cable trays
- Calculate the portable stress or tension in cable pulls

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## *EEST206 Electrical Controls*

### *Instructor Information*

**Name:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Office Hours:** \_\_\_\_\_

**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course will provide the student with a thorough understanding and functions of the various components used in motor control systems. The student will be introduced to the maintenance and troubleshooting functions of motor controls systems. The student will also learn about the different types of devices and components used within motors controls systems. The course will also focus on basic guidelines and procedural information for receiving and storing, handling and installing lamps and lighting fixtures. The student will learn about (NEMA) National Electrical Manufacturers Association as they prepare to work with magnetic coils and relays, contacts and holding circuit interlock and other structural features of solenoids, timers, starters and contactors. The student will also learn about fuses and circuit breakers. They will understand how they provide protection to electrical conductors and equipment against abnormal conditions.

**LEARNING OBJECTIVES**

1. The Technician should reaffirm a basic understanding AC and series and parallel circuits.
2. The EEST will calculate frequency impedance inductance, and capacitances define the following terms controllers, duty cycles, full Load amps, and Interruption rating.
3. The electrical technician will be able to describe the various types of motor enclosures; explain the relationships among speed and frequency, and the number of poles in a three phase motor.
4. The student will learn the design and operation of various motors, and the methods of various motor connections.
5. The technician will describe general motor protection requirement as delineated in the NEC
6. The EEST will define breaking requirements for AC Motors and DC motors
7. The electrical technician will describe the characteristics of light recognize the different kinds of lamps
8. The student will identify and describe the operation of commonly used types of system switches.
9. The EEST must be able classify switches based on schematics diagram symbols, according to the number of poles
10. The electrician shall be able describe the operation principles of contactors and relays
11. The EEST shall install contractor and Relay according to the NEC requirements Select and install contracts and relays for lighting control.
12. The student will learn to explain the differences between Electromechanical and solid state relay
13. The electrical student will identify different types of timing devices and describe how they operate.
14. The EEST will explain the necessity of overcurrent protection devices in electrical circuits
15. The student technician will apply NEC code requirements for overcurrent devices. Describe operation of single element and time delay fuses.

**PREREQUISITE(S)**

EEST 103, 104, 105

**CONTACT HOURS**

90 Contact Hours (40 Lecture Hours and 50 Lab Hours)

**CREDIT HOURS**

3.5 Semester Credit Hours

**TEXTBOOKS**

NCCERconnect with Pearson eText - Trainee Access Card -for Electrical Level 2, 7/e  
National Center for Construction Education and Research  
Pearson Prentice Hall; 2014 NEC Revised; Flesch-Kincaid Reading Grade Level: 9.0

**SOFTWARE REQUIRED**

None

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS*****Grade Distribution***

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting

deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### GRADING POLICY

#### Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A

Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A
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A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program GPA of 2.0

#### **ATTENDANCE POLICY**

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### **REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the makeup work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### **STUDENT CENTERED LEARNING ACTIVITIES**

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

- Participate in discussions, install and operate systems, engage in interactive simulation, participate in practical exercises, and participate in practical evaluations.

#### **TOPICAL OUTLINE**

##### **Motor Circuits**

- Motors and motor controls
- Calculating power factors
- Schematics and Point to Point Diagrams
- Basic Programming Options –Testing –Trouble Shooting

##### **Electric Lighting**

- Ballast Installation
- Systems Operation and Customer Training
- Dip Tolerance
- 

##### **Circuit Breakers**

- Cartridge fuse



- Dual Element fuse
- (MOV)

**Control Systems and Fundamental Concepts**

- Ambient Temperature
- Inductive Load Latch coil
- Mechanically Held Relay
- Normally Closed contacts (N.C.)
- Normally Open contacts (N.O.)
- Solid-state relay

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***EEST207 Computers and Networking***

### ***Instructor Information***

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

In this course, emphasis is placed on identifying and troubleshooting hardware and software components of the PC. Through hands-on projects that simulate real-life scenarios, students will apply concepts taught. Students will study computer applications in the low voltage industries. Application software installation and configuration will be presented during the course of study. Installation and configuration of specialized hardware components is part of the studies. In addition, the student will be able to network several computers together back to a main computer.

**LEARNING OBJECTIVES**

- The students will become knowledgeable of all aspects of assembling, disassembling and troubleshooting a personal computer and the operational parameters and interconnectivity of various types of hardware.
- The students will perform assembly and disassembly of PC's, configuration of hardware, and loading of operating system.
- The students will become knowledgeable of all aspects of network installation, including cabling, configuring and troubleshooting.
- Students will implement their skills and knowledge learned in this course by performing labs.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

90 Contact Hours (41 Hours Lecture / 49 Hours Lab)

**CREDIT HOURS**

3.5 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect with Pearson eText-Trainee Access Card-for Electronic Systems Technician Level 3, 3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2011; Flesch-Kincaid Reading Grade Level: 10.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each

teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

#### ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS

##### Grade Distribution

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

##### **Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

##### **Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

#### ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS

##### Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
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84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	verage Minus	2.0

67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A

A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program GPA of 2.0

#### **ATTENDANCE POLICY**

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### **REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make-up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### **TOPICAL OUTLINE**

##### **Computer Vocabulary and Parts**

- Define Computer Terminology
- Identify Computer Components

##### **Computer & Motherboard Parts Identification**

- Continue to Identify Computer Components
- Identify parts of the motherboard.

##### **Electro-Static Discharge and Electrical Safety**

- Explain how to work on static sensitive devices
- Describe Safely handling of electronic devices

##### **PC Assembly Lab**

- Disassembly and re-assembly of a PC
- Identify parts and their connections within the computer

##### **Computer Application**

- Explain computer and network operations.

##### **Partitioning, Formatting, and Loading an Operating System**

- Explain the booting process using removable media
- Explain how to use FDISK and FORMAT commands
- Describe the procedure to load an operating system

##### **Cable Termination**

- Describe the procedure of terminating patch and cross-over cables
- Creating a patch and a cross-over cable
- Explain the termination of cables to jacks and patch panels
- Terminated cable to jacks and patch panels

##### **Buses and Networks, IP Addresses and Subnets**

- Explain network operations

- Describe IPv4 addressing
- Explain the role of subnet masks in network addressing

**Network Cabling and Topologies, Network Access Methods and Protocols**

- Describe the cabling of home and commercial environments
- Explain the functions of CSMA/CD, TCP/IP, and Ethernet
- Design and create the topology for a Peer-to-Peer Network
- Describe procedures in Windows XP for Networking, File Sharing, Drive Mapping and Windows Network Wizard
- Explain the use of IPCONFIG, PING, and TRACERT for network troubleshooting

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***EEST-208 Fiber Optics, Telecommunication Systems and PLC***

### ***Instructor Information***

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course provides the student knowledge of the basic operation of telephone systems, types of system cables, cable color coding, cable connectors, and installation techniques in addition to identifying the types of data networks, test equipment, and procedures used in testing cables. The student will be familiar with Programmable Logic Controllers and programming them by uses of logic ladders. The student will use the proper procedure and technique to install fiber-optic cabling and support equipment, while describing or demonstrating the types of fiber-optic splicing and/or terminations to achieve an acceptable and "test verified" loss within a specified and acceptable range.

**LEARNING OBJECTIVES**

- The student will be able to describe and apply knowledge relating to the basic operation of telephone systems, types of system cables, cable color coding, cable connectors, and installation techniques in addition to identifying the types of data networks, test equipment, and procedures used in testing cables.
- The student will be familiar with Programmable Logic Controllers and programming them by uses of logic ladders.
- The student will use the proper procedure and technique to install fiber-optic cabling and support equipment, while describing or demonstrating the types of fiber-optic splicing and/or terminations to achieve an acceptable and "test verified" loss within a specified and acceptable range.

**PREREQUISITE(S)**

*EEST 101, 103*

**CONTACT HOURS**

90 Contact Hours (41 Lecture / 49 Lab)

**CREDIT HOURS**

3.5 semester credit hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect w/ Pearson eText-Trainee Access Card-for Electronic Systems Technician Level 3, 3/e  
National Center for Construction Education and Research  
Pearson Prentice Hall; 2011; Flesch-Kincaid Reading Grade Level: 10.0

NCCERconnect w/ Pearson eText - Trainee Access Card - for Electronic Systems Technician Level 4, 3/e  
National Center for Construction Education and Research  
Pearson Prentice Hall; 2012; Flesch-Kincaid Reading Grade Level: 12.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS****Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

**GRADING POLICY****Grade Scale**

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5

80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	verage Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can override course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A

A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program GPA of 2.0

**ATTENDANCE POLICY**

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

**REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make-up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**TOPICAL OUTLINE****Programmable Logic Controllers**

- Describe the purpose of a programmable logic controller
- Compare PLC to hardwired systems
- Numbering Systems and I/O modules
- Explain the conversion of Binary, Hexadecimal, and Decimal numbers
- Explain the purpose of binary codes.
- Explain function and types of I/O modules
- Explain the function, interrelations and characteristics of I/O modules, Processor modules, and Memory

**PLC Programming**

- Explain purpose of PLC software, firmware, programming languages, and ladder logic instructions.
- LAB: Programming PLCs using simulator software and PLC simulator
- Continuation of LAB: Programming PLCs using simulator software and PLC simulator

**Introduction to Telecommunications – Plain Old Telephone Service (POTS)**

- Define Telecommunication
- Explain POTS technology
- Lab – POTS system installation
- Lab – POTS ringer voltage

**Key Systems and Electronic Key Systems**

- Explain Key Telephone System technology
- Explain Electronic Key Telephone System technology

**PBX Systems**

- Explain PBX System technology
- Lab – PBX system installation

**Introduction to Fiber Optics and Fiber Optic Safety**

- Explain Fiber Optics Theory
- Describe Fiber Optic Safety Procedures
- Explain differences between different types of optical connectors
- Describe used of different types of fiber optic cable

**Fiber Optic Termination and Splicing**

- Continue LAB: Terminate a Fiber Optic patch cable
- Explain Fiber Optic splicing procedures
- LAB: Fusion splicing of Fiber Optic cables
- Continue LAB: Fusion splicing of Fiber Optic cables
- Final Examination

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***EEST-209 Security Systems, Access Control and CCTV Systems***

**COURSE TITLE**

EEST-209 Security System, Access Control, and CCTV Systems

## Security System, Access Control, and CCTV Systems

**COURSE NUMBER**

EEST-209

**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course is designed to provide the student with the knowledge and skills to install and troubleshoot nurse call and signaling systems, entry/access control systems, intrusion detection, security, and surveillance systems (included is CCTV system and key components of a CCTV system), Lighting, HVAC, Water, and Access systems. Students will learn the function and how to install and troubleshoot systems in the areas of nurse call, access control, security systems and intrusion detection, video surveillance, as well as lighting, HVAC, and water control systems.

**PREREQUISITE(S)**

EEST 101, 102, 103, 104, 105

**CO-REQUISITE(S)**

None

**INSTRUCTIONAL CONTACT HOURS/CREDITS**

90 Contact Hours (45 Hours Lecture / 45 Hours Lab)  
3.5 Semester Credit Hours

**LEARNING OBJECTIVES**

- The Technician must reaffirm a basic understanding of Ohm's Law as it pertains to Electronic Security Systems
- The Technician must reaffirm a basic understanding of the different type of control devices in Electronic Security Systems
- The Technician must reaffirm a basic understanding of the different type of wire topologies in Electronic Security Systems
- The Technician must Identify the term..."TELEPHONY" Demonstrate features of the RJ-11 Voice grade jack
- The Technician will described the typical uses, operation and configuration of various CCTV systems
- The Technician must identify the components that make up a CCTV system
- The Technician must demonstrate how to select the proper lens and equipment for a given application or installation
- The Technician must demonstrate how light can affect the proper installation and testing requirements of a CCTV system

- The Technician must illustrate the proper procedures and techniques for troubleshooting a CCTV system
- The Technician must discuss the application and operation of an Access Control System using various types of devices.
- The Technician will identify and demonstrate the different types of controller topologies
- The Technician must plain the operation of typical entry control systems and their associated access control
- The Technician must describe the different applications and relative advantages and disadvantages of various methods of access control.

#### **INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect with Pearson eText -- Trainee Access Card -- for Electronic Systems Technician Level 4, 3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2012; Flesch-Kincaid Reading Grade Level: 12.0

#### **INSTRUCTIONAL METHODS**

A variety of teaching strategies may be utilized in this course including but not limited to: lecture, discussion, PowerPoint presentations, classroom exercises, student oral presentations, lab exercises, and written reports, outside reading assignments, demonstrations, and examinations.

#### **ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS**

##### Grade Distribution

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

##### **Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

##### **Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group



context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### GRADING POLICY

#### Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
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Withdrawal	W	Withdrawal after the add/drop period	N/A
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Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A

Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A
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A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program GPA of 2.0

#### **ATTENDANCE POLICY**

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### **REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### **Student Centered Learning Activities**

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

- Observe demonstrations, participate in practical application, participate in group discussions, read and interpret, and participate in practical evaluations.

#### **EQUIPMENT NEEDED**

Please see attached Inventory of Instructional Equipment by Course of Instruction or Subject

### **Topical Outline**

#### **Access Control System**

- The operation of an Access Control System using various types of devices

- Zone Programming; System Programming
- Install a Fingerprint Credential
- Single Door Access Controller

**Operation and configuration of various CCTV systems**

- Identify the components that make up a CCTV system
- Request-to-Exit PIR
- Analog and IP Cameras
- DVR Recording frames per second

**Intrusion Detection systems Arm-Disarm system through**

- Zone Programming; System Programming
- Pre-Termination Checklist with test equipment troubleshoot for Shorts; Grounds and Opens

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***EEST-210 Fire Alarm Systems***

### ***Instructor Information***

**Name:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Office Hours:** \_\_\_\_\_

**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course provides the student with the knowledge and skills required to successfully, plan, install and problem-solve, both standard Fire Alarm systems and Programmable Fire Alarm systems. Students will be taught the proper methods and equipment to use in residential and industrial fire-detection applications. Proper wiring/cable selection, fire-detection equipment selection, and system layout/planning will be obtained in this course of study. Programming of Fire Alarm devices and systems will be introduced. Theory of typical Fire Alarm software will be presented in this course of study. Hands-on practices of the software applications are included in the course of study.

**LEARNING OBJECTIVES**

- The Technician will correctly use the trade terminology associated with fire alarm systems.
- The Technician must have a basic understanding of how Electricity and Electronics are involved in the Industry
- The Technician should have knowledge of Codes and Standards related to the Industry
- The Technician must be able demonstrate proper Wiring Techniques
- The Technician needs to identify types and describe characteristics of Initiating Devices, Notification Devices, Control Units, and Control Panels
- The Technician must explain and describe the different types of circuitry that connect fire alarm system components
- The Technician must explain introductory fire alarm system design methods and considerations.
- The Technician must be able to understand troubleshooting concepts for a fire alarm system.
- The Technician with a Point to Point diagrams install a conventional and addressable system consisting of sensors, notification devices, a control panel, a control unit and an annunciator.
- Student must be able to explain ESD and how effects Electronic components

**PREREQUISITE(S)**

*EEST 101, 102, 103, 104, 105*

**CONTACT HOURS**

90 Contact Hours (45 Hours Lecture / 45 Hours Lab)

**CREDIT HOURS**

3.5 semester credit hours

#### **INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect w/ Pearson eText-Trainee Access Card-for Electronic Systems Technician Level 3, 3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2011; Flesch-Kincaid Reading Grade Level: 10.0

NCCERconnect with Pearson eText -- Trainee Access Card -- for Electronic Systems Technician Level 4, 3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2012; Flesch-Kincaid Reading Grade Level: 12.0

#### **INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

#### **ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS**

##### **Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

##### **Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

##### **Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of

other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### **GRADING POLICY**

#### Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in Internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education	N/A

Services School. "TR" is not considered in computing the Grade Point Average

Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A
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A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program **GPA of 2.0**

#### Attendance Policy

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### **REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### **SOFTWARE**

- None

#### **TOPICAL OUTLINE**

##### **Fire Control Panels (Basic Conventional System)**

- Reaffirm a basic understanding of the different types of control devices within the Fire Alarm System User Control points
- Discuss with the students the difference between a Code and a Standard and why they are necessary FACU Primary/ Secondary power

##### **Fire Alarm System Equipment; Fire Alarm Initiating Devices**

- Conventional Versus Addressable Commercial Detectors
- Identify the terms IDC's; NAC's; TC's



- Identify the ABC's of Power Heat, Smoke Detectors, and Manual Fire Alarm Boxes
- Sprinkler System Fire Alarm and Supervision Equipment

**General Installation Guidelines**

- Consider the following: Conduit Fill, Box Fill; AFF vs. BFC
- Identify Input vs. Output; Battery Calculations; NAC Voltage Drops
- Consider the following Stratification; Boundaries; Barriers; Air Handlers

**Introduction to codes and standards**

- Explain how to use and find information in the NEC
- Explain the role of the testing laboratories.
- Inspection and Testing

**Maintenance and Repair**

- ESD and how effects Electronic components
- Fault isolation diagrams
- Preventive maintenance
- Troubleshooting
- Flow Charts
- Record of completion

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## *EEST-211 A/V Home Theater and Satellite/ Cable TV*

**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course is designed to provide the student with the knowledge and skills required to install and troubleshoot rack systems, system integration, and residential systems integration. The students will be taught component function and how to install complete systems racks, residential automation systems. The students will be taught system commissioning and how to train client based systems. In addition, they will learn finish phase testing along with maintenance and repair.

**LEARNING OBJECTIVES**

- The Technician will describe characteristics and relationships between voltage, current and resistance explain OHM'S Law, Kirchhoff's Law as well as Watt's law draw schematic representation using resistor color codes
- The Technician will identify the primary components of audio system Identify typical audio systems for sound reinforcement, input devices and amplification.
- The Technician will describe the fundamental principles for wireless radio frequency(RF) Identify the basic components used in wireless systems
- The Technician will explain the operating principles and application satellite communication systems
- The Technician should identify the proper installation and termination of RG-6 cables with F-con.
- The Technician must cable selection and speaker placement.
- The Technician will describe the characteristics of analog vs. digital video signals.
- The Technician will describe video display technologies and video monitoring equipment.
- The Technician will explain video processing methods and equipment.
- The Technician will describe cabling and connectors used in video systems.
- The Technician will perform basic system installation procedures including terminate an HD5 connector.
- The Technician will explain a block diagram for selected CATV SATV MATV systems.
- The Technician identifies various types of electronic equipment rack.
- Select appropriate rack for given applications.
- Discuss purpose for grounding of racks.

**PREREQUISITE(S)**

*EEST 101, 102, 103, 104, 105*

**CONTACT HOURS**

90 Contact Hours (45 Lecture / 45Lab)

**CREDIT HOURS**

3.5 semester credit hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect w/ Pearson eText-Trainee Access Card-for Electronic Systems Technician Level 3, 3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2011; Flesch-Kincaid Reading Grade Level: 10.0

NCCERconnect with Pearson eText -- Trainee Access Card -- for Electronic Systems Technician Level 4, 3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2012; Flesch-Kincaid Reading Grade Level: 12.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies may be utilized in this course including but not limited to: lecture, discussion, presentations, classroom exercises, written exercises, oral presentations by students, written reports, outside reading assignments, demonstrations, and examinations.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS****Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### GRADING POLICY

#### Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	verage Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is	N/A

not considered in computing the Grade Point Average

Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A
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A student earning a grade of D- or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to an overall program GPA of 2.0

#### ATTENDANCE POLICY

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make-up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### STUDENT CENTERED LEARNING ACTIVITIES

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

- Participate in discussions, demonstrations, practical applications and exercises, and practical evaluations.

#### TOPICAL OUTLINE

##### Ohms Law

- Identify the many ways Voltage it can be produced
- Explain the Atomic theory, construction and behavior of atoms transfer its electrons to create current flow

##### DC Circuits & Speaker loads

- Describe characteristics and relationships between voltage, current and resistance

- Explain OHM'S Law schematic representation using resistor color codes

**Audio systems**

- Identify the primary components of audio system
- Identify typical audio systems for sound reinforcement, input devices and amplification

**Video systems**

- Describe different video systems and how they operate
- Describe the difference between analog and digital video
- Explain High Definition Format and Cabling.

**Rack Systems**

- Identify Various types of electronic equipment racks
- Select the appropriate rack for a given application

**Broadband Systems**

- Draw a block diagram of a CATV /SMATV/ MATV system.
- Select and terminate co-axil cables and F-Connectors
- Use selected test equipment to make measurements and checkers in CATV/SMATV/MATV systems in order to evaluate system operation.

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***EEST-212 System Integration***



**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course is designed to prepare the student to take the ESPA Exam as well as provide the student with the knowledge and skills required to install and troubleshoot integrated systems. The students will be taught component function and how the skills and technologies learned in previous modules can be integrated together and automated.

**LEARNING OBJECTIVES**

- Define the term systems integration, and identify typical situations when you might encounter systems integration.
- Describe the various configurations of residential and commercial networked systems
- Explain the various connection options and protocols commonly used for the integration
- Describe network configurations
- Describe the various user interfaces used for integrated systems monitoring and control
- Examine methods of communication between devices and controllers
- Explain how integrated systems can be remotely accessed and controlled
- Describe the best practices for interoperability and system performance.
- Explain the various interconnection options and protocols commonly used for integration.
- Describe the network configurations used and the wiring schemes and fault-tolerant procedures designed for system redundancy.
- Identify elements of the infrastructure.
- Identify the components of the Structured media Center.
- Describe the role of the control processor.
- Understand how residential gateways work.
- Be able to document the entire system to meet the customer's needs.

**PREREQUISITE(S)**

EEST 101, 102, 103, 104, 208, 209, 211

**CONTACT HOURS**

90 Contact Hours (45 Lecture / 45Lab)

**CREDIT HOURS**

3.5 semester credit hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

NCCERconnect with Pearson eText -- Trainee Access Card -- for Electronic Systems Technician Level 4,  
3/e

National Center for Construction Education and Research

Pearson Prentice Hall; 2012; Flesch-Kincaid Reading Grade Level: 12.0

### INSTRUCTIONAL METHODS

A variety of teaching strategies will be used to conduct this course. These include but are not limited to daily lectures, classroom discussions, classroom/laboratory exercises, demonstrations, and examinations. Power point presentations, video tapes, and hand out materials will be inserted as appropriate during each teaching-learning activity.

### ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS

#### Grade Distribution

Out-of-Class Assignments	10%
Assessments (quizzes, practical's)	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

#### **Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

#### **Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### GRADING POLICY

#### Grade Scale

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
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90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8

# EEST 212 System Integration

# Syllabus

84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the add/drop period	N/A
Withdrawal	W	Withdrawal after the add/drop period	N/A
Pass	P	Received by students in internship / externship or Developmental Courses. "P" is not considered in computing the Grade Point Average	N/A
Pass	PD	Received by students in Developmental Courses. "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NP	Received by students in internships / externship and Developmental Courses	N/A
Non-Pass	NPD	Received by students in Developmental Courses. "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course	N/A
Retaken Override	R*	If a student is given an exception, the Registrar can over-ride course retake	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than Lincoln Education Services School. "TR" is not considered in computing the Grade Point Average	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average	N/A

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**ATTENDANCE POLICY**

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

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**REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**STUDENT CENTERED LEARNING ACTIVITIES**

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

- Observe demonstrations, participate in practical application, participate in group discussions, read and interpret, and participate in practical evaluations.

**TOPICAL OUTLINE****ESPA Electrical Basics**

- Identify the four basic units of measurement used with electricity, and be able to explain how they relate in Ohm's Law.
- Identify differences between AC and DC

**Tools**

- Read and identify planning tools, including construction drawings and symbols on drawings,
- Identify hand tools power tools, and test equipment their uses, storage, and maintenance

**Construction Methods and Materials**

- Identify various construction methods and materials to promote safety, productivity, and quality on a job/project.

**Wiring and Installation Practices**

- Identify wire and cable materials
- Identify termination types, pin-out configuration, wire preparation and termination techniques, and connection points on cables and equipment

- Identify the use of fasteners, anchors, and back boxes used to mount cable and other equipment

**Codes, Standards and Safety Practices**

- Identify the concept of industry accepted standards and best practices.
- Identify applicable building codes.
- Identify applicable safety practices

**System Integration for Residential and Commercial Building Networks**

- Understand how individual subsystems can be networked together
- Understand the fundamentals of networking
- Understand IP addressing

**Equipment and Cable Schedules**

- Understand the need for proper documentation
- Learn how to create equipment and Cable schedules used for the installation of Integrated systems

**Rough-in**

- Understand the rough-in process including codes and installation requirements
- Practice a rough-in installation of low voltage boxes and cables
- Practice wall snaking techniques
- Practical application of wiring and termination of integrated system devices.
- Application of wiring and termination of integrated system devices

**Panel termination and wire management**

- Practice the practical application of wiring and termination of controllers and distribution modules
- Panel termination and wire management
- Practice the practical application of wiring and termination of controllers and distribution modules

**Finish phase**

- Practice the practical application of testing, programming and troubleshooting an integrated system
- Practice the practical application of testing, programming and troubleshooting an integrated system
- Customer training

**DATE SYLLABUS WAS LAST REVIEWED**

May 2, 2016

# Syllabus Syllabus

## ***GEN089 Basic Mathematics***

### *Instructor Information*

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course focuses on concepts and applications of arithmetic, including whole numbers, fractions, ratios, proportions, the decimal system, and percents. Brief introductions to algebra, formulas, algebraic expressions, and linear equations are also included. Special emphasis is placed on the application of basic math skills to common workplace problems and real-life situations.

**LEARNING OBJECTIVES**

- Solve arithmetic problems by applying the rules of whole numbers
- Recognize real world applications of arithmetic concepts
- Solve arithmetic problems by applying the rules of fractions
- Solve arithmetic problems by applying the rules of decimals
- Solve arithmetic problems involving ratios and proportions
- Solve arithmetic problems involving percentages
- Assess the various guidelines and principles for using data, statistics, and graphs
- Investigate measurements, various units of measurements, and the application of measurements
- Solve problems applying geometry rules and formulas
- Solve arithmetic problems involving real numbers
- Solve problems applying algebra rules and formulas
- Use problem solving skills to apply basic math concepts to real world situations

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

Basic College Mathematics, 7th Edition

John Tobey, Jeffrey Slater

Pearson Prentice Hall; 2012, Flesch-Kincaid Reading Grade Level: 8.2

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource

Center” will also be used as appropriate to complete assigned research. This course is delivered via the Residential model.

### ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS

#### Grade Distribution

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments (classroom and online work)	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

#### **Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student’s understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

#### **Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people’s concerns are essential to success. Please bring these qualities and values with you to class. It is as important to ‘practice’ these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### GRADING POLICY

**At the end of each course, each student is assigned a final grade as follows:**

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5



70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work.	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the drop/add period.	N/A
Withdrawal	W	Withdrawal after the drop/add period.	N/A
Pass	P	Received by students in internships/externships. "P" is not considered in computing the Grade Point Average.	N/A
Non-Pass	NP	Received by students in internships/externships. "NP" is not considered in computing the Grade Point Average.	N/A
Pass	PD	Received by students in Developmental Courses (only applies to Columbia Campus). "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NPD	Received by students in Developmental Courses (only applies to Columbia Campus). "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course.	N/A
Retaken Course	R*	If a student is given an exception, the Registrar can over-ride course retake.	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than a Lincoln Educational Services School. "TR" is not considered in computing the Grade Point Average.	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average.	N/A

A student earning a grade of **D-** or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of **F** has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to maintaining an overall program **GPA of 2.0**

#### ATTENDANCE POLICY

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#### REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE

At a minimum, students must achieve the following: a passing grade of **D-** or above completion of all required examinations, submission of all required lab exercises and

projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

### **TOPICAL OUTLINE**

Class Introductions

Class Syllabus and Objectives

#### **Topic: Whole Numbers**

- Understanding Whole Numbers
- Adding Whole Numbers
- Subtracting Whole Numbers
- Multiplying Whole Numbers
- Dividing Whole Numbers
- Exponents and the Order of Operations
- Rounding and Estimating
- Solving Applied Problems Involving Whole Numbers

**Homework: Reading assignment; Selected exercises**

#### **Topic: Fractions**

- Understanding Fractions
- Simplifying Fractions
- Converting Between Improper Fractions and Mixed Numbers
- Multiplying Fractions and Mixed Numbers
- Dividing Fractions and Mixed Numbers
- The Least Common Denominator and Creating Equivalent Fractions
- Adding and Subtracting Fractions
- Adding and Subtracting Mixed Numbers and the Order of Operations
- Solving Applied Problems Involving Fractions
- Lab activities

**Homework: Reading assignment; Selected exercises**

#### **Topic: Decimals**

- Using Decimal Notation
- Comparing, Ordering, and Rounding Decimals
- Adding and Subtracting Decimals
- Multiplying Decimals
- Dividing Decimals

- Converting Fractions to Decimals and the Order of Operations
- Estimating and Solving Applied Problems Involving Decimals
- Lab activities

**Homework: Reading assignment; selected exercises**

**Topic: Ratio and Proportion**

- Ratios and Rates
- The Concept of Proportions
- Solving Proportions
- Solving Applied Problems Involving Proportions
- Lab activities

**Homework: Reading assignment; selected exercises**

**Topic: Percent**

- Understanding Percent
- Changing Between Percents, Decimals, and Fractions
- Solving Percent Problems Using Equations
- Solving Percent Problems Using Proportions
- Solving Applied Percent Problems
- Solving Commission, Percent of Increase or Decrease, and Interest Problems
- Lab activities

**Homework: Reading assignment; selected exercises; study for midterm**

**Topic: Review and Midterm Exam**

- Whole Numbers
- Fractions
- Decimals
- Ratio and Proportion
- Percent

**Homework: Reading assignment; selected exercises**

**Topic: Measurement**

- American Units
- Metric Measurements: Length
- Metric Measurements: Volume and Weight
- Converting Units
- Solving Applied Measurement Problems
- Lab activities

**Homework: Reading assignment; selected exercises**

**Topic: Geometry**

- Angles

- Rectangles and Squares
- Parallelograms, Trapezoids, and Rhombuses
- Triangles
- Square Roots
- The Pythagorean Theorem
- Circles
- Volume
- Similar Geometric Figures
- Solving Applied Problems Involving Geometry
- Lab activities

**Homework: Reading assignment; selected exercises**

**Topic: Statistics**

- Circle Graphs
- Bar Graphs and Line Graphs
- Histograms
- Mean, Median, and Mode
- Lab activities

**Homework: Reading assignment; lab activities**

**Topic: Introduction to Algebra**

- Variables and Like Terms
- The Distributive Property
- Solving Equations Using the Addition Property
- Solving Equations Using the Division or Multiplication Property
- Solving Equations Using Two Properties
- Translating English to Algebra
- Solving Applied Problems
- Lab activities
- Review for final exam

**Homework: Reading assignment; study for final**

Math in Real life

Final Exam

**STUDENT CENTERED LEARNING ACTIVITIES**

- The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.
- Students can access additional information by using:
- [www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation

- [www.howstuffworks.com](http://www.howstuffworks.com)
- [www.vimeo.com](http://www.vimeo.com)
- [www.youtube.com](http://www.youtube.com)
- [www.video.about.com](http://www.video.about.com)
- [www.ehow.com](http://www.ehow.com)
- [www.khanacademy.org](http://www.khanacademy.org)

**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# Syllabus Syllabus

## ***GEN099 Foundations of English***

### **Instructor Information**

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course is designed to give students guided practice in the fundamental skills they will need to complete college-level reading and writing assignments. Mastery and review of basic English concepts, essential to successful college and work experience, will be emphasized throughout the course. Students will apply their learning to a variety of writing activities that emphasize the development of paragraphs and essays.

**LEARNING OBJECTIVES**

- Identify and use strategies to improve your reading skills.
- Describe and demonstrate the four steps of the writing process.
- Correctly identify and use nouns, pronouns, adjectives, verbs and adverbs.
- Accurately identify and use the four types of sentences—declarative, interrogative, imperative and exclamatory.
- Relate understanding of comma usage.
- Differentiate between compound sentences, complex sentences, compound-complex sentences, and fragments.
- Demonstrate effective writing skills using the stages of writing in building an essay.
- Identify parts of a paragraph and differentiate between the paragraph pattern types.
- Identify essay components and differentiate between the types of essay patterns.
- Construct grammatically correct paragraphs and essays.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

The Writer's World: Paragraphs and Essays, 3rd Edition

Lynne Gaetz and Suneeti Phadke

Pearson; 2011, Flesch-Kincaid Reading Grade Level: 8.5

Applying English to Your Career, 1<sup>st</sup> Edition

Deborah Davis and Donnelin

Pearson; 2006, Flesch-Kincaid Reading Grade Level: 10.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research. This course is delivered via the Residential model.

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Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
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Professionalism	15%
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Final Exam	10%
<b>Total</b>	<b>100%</b>

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**Professionalism**

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**REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

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**TOPICAL OUTLINE****Lesson Title: Introduction**

- Course introduction and standards of performance expected in this course
- Understanding the writing process
- Discussion of the writing process—exploring, developing, revising and editing
- Qualities of good writing
- Preparing to write--exploring
- Topic, Audience, Purpose
- Importance of grammar and spelling

**Homework:** Reading assignment; Selected Assignments from *Applying English* or *Grammar Workbook*

**Lesson Title: Developing Effective Sentences and Paragraphs**

- Simple sentences, complex sentences, sentence variety
- Avoiding common sentence problems
- Parts of speech review
- Structure of paragraphs--topic, supporting and summary sentences
- Paragraph patterns -Direction, unity, coherence, and support
- Fragments and run-ons

**Homework:** Reading assignment; Selected Assignments from *Applying English* or *Grammar Workbook*

**Lesson Title: Review of Verbs: The Description Paragraph**

- Subject verb agreement
- Regular and irregular verbs
- Correct and incorrect use of verbs in writing samples
- Descriptive paragraph guidelines

**Homework:** Reading assignment; Selected Assignments from *Applying English* or *Grammar Workbook*

**Lesson Title: Review of Nouns: The Process Paragraph**

- Common and proper nouns.
- Correct and incorrect use of nouns and capitalization in writing samples
- Guidelines for writing a process paragraph
- Individual writing conferences

**Homework:** Reading assignment; Selected Assignments from *Applying English* or Grammar Workbook

**Lesson Title: Review of Pronouns: The Narration Paragraph**

- Types of Pronouns
- Guidelines for using pronouns
- Incorrect and correct usage of pronouns in writing samples
- Guidelines for writing a narration paragraph
- In class essay /mid term exam

**Homework:** Reading assignment; Selected Assignments from *Applying English* or Grammar Workbook

**Lesson Title: Review of Modifiers: The Classification Paragraph**

- Various types of modifiers in writing samples
- Dangling and misplaced modifiers in writing samples
- Guidelines for writing a classification paragraph
- Diagramming sentences

**Homework:** Reading assignment; Selected Assignments from *Applying English* or Grammar Workbook

**Lesson Title: Revising and Editing: The Comparison and Contrast Paragraph**

- Purpose and process for revising and editing
- Applying editing and revising techniques to past writing assignments
- Individual writing conferences
- Guidelines for writing a comparison and contract paragraph

**Homework:** Reading assignment; Selected Assignments from *Applying English* or Grammar Workbook

**Lesson Title: Review of Punctuation: The Cause and Effect Paragraph**

- Proper and improper use of commas and end marks in writing samples
- Proper and improper use of apostrophes and quotation marks in writing samples
- Guidelines for writing a cause and effect paragraph

**Homework:** Reading assignment; Selected Assignments from *Applying English* or Grammar Workbook

**Lesson Title: Review of Spelling and Diction: The Definition Paragraph**

- Commonly misspelled words
- Guidelines for writing a definition paragraph
- Information literacy component and research assignment

**Homework:** Reading assignment; Selected Assignments from *Applying English* or Grammar Workbook

**Lesson Title: Essay and Essay Patterns**

- Key elements of an essay
- Editing/revising/drafts
- Citing sources

**Homework: Research assignment; study for final**

- Grammar review
- Grammar and usage test
- In class final essay or project

**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# Syllabus Syllabus

## ***GEN130 Introduction to Critical Thinking***

### *Instructor Information*

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course presents students with techniques to develop their critical thinking skills. Topics include the six sequential steps of critical thinking, the importance of language, ambiguity, structure of arguments and creative problem solving. Upon successful completion of this course students should be able to demonstrate an improvement in their ability to apply critical thinking skills to real world situations.

**LEARNING OBJECTIVES**

Upon completion of this course, students will be able to:

- Utilize the lessons and exercises imparted in the course; define facts, opinions, ambiguous language, truth, and fallacies, while utilizing this knowledge to successfully understand and share accurate information in the appropriate forms of discourse.
- The student will gain knowledge in dissecting and analyzing the types and characteristics of arguments, premises, and conclusions, while acquiring and applying problem solving skills to defend a position or analyze a scenario.
- The students will apply the six steps of critical thinking as core logic to identify the topic and main points of an argument or written position, while fostering comprehension, understanding information, and applying the appropriate communication and language in support of the issues.
- By gaining an understanding of critical thinking concepts, the student will be able to apply these ideas and techniques in an analytical, structured, and rational method in the process of resolving issues, facilitating consensus, and influencing opposing parties on issues in dispute or consideration.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**TEXTBOOKS**

(Bundle)

The Art of Thinking (A Guide to Critical and Creative Thought), 11<sup>th</sup> Edition

Vincent Ruggiero

Pearson; 2015; Flesch-Kincaid Reading Grade Level: 11.0

Case Studies for the First Year: An Odyssey into Critical Thinking and Problem Solving

Rob Sherfield

Pearson; 2015; Flesch-Kincaid Reading Grade Level: 10.0

**INSTRUCTIONAL METHODS**

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### TOPICAL OUTLINE

#### 1.0 Understanding the construction and importance of critical thinking

- 1.1 Define the characteristics of critical thinking.
- 1.2 Distinguish fact from opinion and truth from falsity.
- 1.3 Recognize ambiguous language.
- 1.4 Define the three types of information discourse.
- 1.5 Locate and argument in written material.
- 1.6 Test for premises and conclusions.
- 1.7 Define deductive argument and inductive argument.
- 1.8 Identify the steps to creative problem solving.
- 1.9 Identify fallacies.

#### 2.0 Critical thinking applications

- 2.1 Identify and apply the six steps of critical thinking.
- 2.2 Identify the topics, main points, or thesis of an argument or written position.
- 2.3 Communication language supporting the main points or the thesis.
- 2.4 Understanding the information, fostering comprehension.
- 2.5 Distinguishing fact from fiction.
- 2.6 Distinguish facts from opinions.
- 2.7 Identify and explain various types of ambiguous language in written materials.
- 2.8 Testing for premises and determining conclusions.
- 2.9 Writing while using critical thinking methods.

#### 3.0 Discovering the construction of arguments

- 3.1 Define deductive argument and inductive argument.
- 3.2 Diagram and evaluate arguments.
- 3.3 Understanding assumptions, generalizations, and analogies.

### TOPICAL OUTLINE

Class introductions  
Syllabus and Objectives

#### Lesson Title: Introduction to Critical Thinking

Characteristics of critical thinkers  
Standards of critical thinking  
Benefits and barriers to critical thinking

Argument and critical thinking

**Lesson Title: Recognizing arguments; Logical concepts and language**

Basic logical concepts and the importance of language  
Common patterns of deductive and inductive reasoning  
Arguments based on deductive or inductive reasoning  
Valid deductive argument  
Strong inductive argument  
Precision, definitions and emotive language, euphemisms

**Lesson Title: Fallacies and Argument Analysis**

Logical fallacies  
Fallacies of relevance  
Fallacies of insufficient evidence  
Concept of relevance within an argument

**Lesson Title: Short arguments**

Analyze and diagramming of short arguments

**Homework: Review for midterm**

Midterm examination  
Information literacy

**Lesson Title: Evaluating Arguments, inductive reasoning**

How to identify a good argument  
Acceptable premises  
Inductive generalizations  
**Homework: Critique of sample critical essays**

**Lesson title: Evaluating statistical arguments**

Strength and weaknesses

**Lesson Title: Induction and analogy**

Generalizations  
Opinion polls  
**Homework: exercises on opinion polls and generalizations**

**Lesson Title: Probability and induction**

Correlation and cause  
Prior probability  
**Homework: Probability assignment**

**Lesson Title: Finding and evaluating sources**

Using sources, evaluating sources  
The mass media and news media  
**Homework: Citation and web evaluation assignment**

**Lesson Title: Writing a successful argument**

Drafts and edits  
Presenting a successful argument

**Lesson Title: Final Exam**

Prepare for and administer final exam.

**STUDENT CENTERED LEARNING ACTIVITIES**

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

Students can access additional information by using:

[www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation

[www.howstuffworks.com](http://www.howstuffworks.com)

[www.vimeo.com](http://www.vimeo.com)

[www.youtube.com](http://www.youtube.com)

[www.video.about.com](http://www.video.about.com)

[www.ehow.com](http://www.ehow.com)

[www.khanacademy.org](http://www.khanacademy.org)

**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# Syllabus Syllabus

## ***GEN150 Environmental Science***

### ***Instructor Information***

**Name:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Office Hours:** \_\_\_\_\_

**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course is designed to provide students with a basic scientific overview of how nature works and how things in nature are interconnected. This course explores the study of the earth's natural resources. Topics include the study of how air, water, soil, natural energy, and the minerals are critical and related parts of the earth's interconnected systems.

**LEARNING OBJECTIVES**

Upon completion of this course, students will be able to:

- The student will gain knowledge in dissecting and analyzing what is defined as the earth's natural capital. By studying the earth's resources and the consumption and recycling of those resources the student will quantify the state of the earth's capital wealth has if it were measured against a business model. The student will analyze results in order to draw conclusions, and identify problem solving scenarios to defend or support a position.
- The students will study the human consumption of the earth's resources and apply models moving forward to project the state of the earth's population and ability to replenish certain human consumed earth resources.
- By gaining an understanding of human centered environmental worldviews versus life centered environmental worldviews, the student will be able to draw conclusions and identify which cultures waste a great deal of the earth resources and which cultures are diligent about their role in preserving the delicate balance between the human race and the planet we live on.
- The students will learn how to classify and test various scientific models and behaviors of life cycle systems in order to quantify them in scientific terms. The students will further study the relationship between matter systems and energy and will be able to correctly identify how matter and energy are measured in scientific terms.
- Upon studying the various ecosystems that are present on the earth and the factors that shape and sustain them, the student will explore the impact that humans have made to these systems and attempt to quantify what this will mean for the future of the planet. The student will attempt to measure and quantify the inclination to embrace technology and industrialization at a cost on the earth's natural capital. The student will attempt to measure that cost in terms of money, time, or scientific terms.
- The students will study the earth's climate and terrestrial biodiversity makeup both on the earth ground surface and in the oceans. Topics include the Ozone layer, the earth's rotation, temperature zones, and the adaptation of the earth's population of all species of animal and plant life. The student will recognize and identify how deviations and fluctuation in the terrestrial climate has and will affect all life forms.
- By gaining an understanding of how different species interact with each other to create an ecological community, the student can study how population dynamics within those interdependent community groups can survive and benefit. The student will be able to draw conclusions and identify which variables, if left unchecked could destroy the balance between the life forms in that community and how that in turn will affect all other communities that interact on the planet.

- The student will study the environmental ecology and focus on the natural and manmade processes that shape the landscape and affect the chemical balance of the planet's soil and minerals. The student will also study the long and short term effects of geologic activity and manmade mining activity on the plant kingdom's culture. The student should be able to discuss and correctly characterize activity that endangers life activity by increasing toxic chemicals and gasses into the atmosphere.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**TEXTBOOKS**

Essential Environment: The Science Behind The Stories, 4th Edition

Jay Withgott

Pearson; 2012; Flesch-Kincaid Reading Grade Level: 11.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model

**Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments (classroom and online work)	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

### Professionalism

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### GRADING POLICY

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
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77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work.	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the drop/add period.	N/A
Withdrawal	W	Withdrawal after the drop/add period.	N/A
Pass	P	Received by students in internships/externships. "P" is not considered in computing the Grade Point Average.	N/A
Non-Pass	NP	Received by students in internships/externships. "NP" is not considered in computing the Grade Point Average.	N/A
Pass	PD	Received by students in Developmental Courses (only applies to Columbia Campus). "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NPD	Received by students in Developmental Courses (only applies to Columbia Campus). "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course.	N/A
Retaken Course	R*	If a student is given an exception, the Registrar can over-ride course retake.	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than a Lincoln Educational Services School. "T"	N/A

		considered in computing the Grade Point Average.	
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course is not considered in computing the Grade Point Average.	N/A

A student earning a grade of **D-** or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of **F** has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to maintaining an overall program **GPA of 2.0**

#### ATTENDANCE POLICY

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE

At a minimum, students must achieve the following: a passing grade of **D-** or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### TOPICAL OUTLINE

##### Lesson Title: Humans and Sustainability

- Define sustainability and understand what it means to live "sustainably."
- Describe a simple model and a more complex model of relationships among population, resource use, technology, environmental degradation, and pollution.
- Describe early forms of agriculture and changes that occurred in human population distribution, employment, and relationships between societies as the Agricultural Revolution unfolded.
- Compare the human-centered environmental worldviews with the life-centered and earth-centered environmental worldviews
- Identify differences in beliefs about the relationships between humans and nature, resource availability, and environmental protection.

##### Lesson Title: Scientific Principles and Concepts

- Investigate the first and second laws of energy.
- Describe layers or spheres of the earth and compare the flow of matter and the flow of energy through the biosphere.



- Describe the hydrologic cycle and distinguish among evaporation, transpiration, condensation, precipitation, infiltration, percolation, and runoff.
- Define *ecosystem services* and explain how they are important to human life.
- Describe biodiversity in terms of speciation and extinction.
- Distinguish between weather and climate.
- Describe factors that determine patterns of global air circulation.
- Describe how climate affects the distribution of plant life on Earth and compare the climate and adaptations of plants and animals in deserts, grasslands, and forests.
- Define biomes.
- Describe examples of biomes.
- Define succession and distinguish between primary and secondary succession.
- Describe population growth and its relationship to resource use.
- Define carrying capacity and describe how carrying capacity affects exponential growth.
- Describe the problems associated with soil erosion and desertification.
- Identify the four classes of common hazards and describe their potential impact on humans and the environment.
- Identify the four classes of common hazards and describe their potential impact on humans and the environment.
- Define toxicology and identify three types of studies that contribute to our knowledge of toxicology.
- Define risk analysis and identify its limitations

#### STUDENT CENTERED LEARNING ACTIVITIES

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

Students can access additional information by using:

[www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation  
[www.howstuffworks.com](http://www.howstuffworks.com)  
[www.vimeo.com](http://www.vimeo.com)  
[www.youtube.com](http://www.youtube.com)  
[www.video.about.com](http://www.video.about.com)  
[www.ehow.com](http://www.ehow.com)  
[www.khanacademy.org](http://www.khanacademy.org)

#### DATE SYLLABUS WAS LAST REVIEWED

February 17, 2015

# Syllabus Syllabus

## *GEN160 Psychology*

### *Instructor Information*

**Name:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Office Hours:** \_\_\_\_\_

**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course introduces human behavior. It includes the study of the theories and concepts of psychology including the scope of psychology, biological foundations and the brain, sensation, perception, motivation, personality, learning/memory, emotion, states of consciousness, personality theories, cognition, life-span development, and applied psychology.

**LEARNING OBJECTIVES**

Upon completion of this course, students will be able to:

- Examine the field of psychology in terms of history, key perspectives and issues, current trends, scientific and research methods
- Explain the anatomical structures and physiological functions related to psychology
- Examine sensation, perception, heredity and genetics
- Analyze consciousness, sleep, sleep disorders, and hypnosis as related to psychology
- Analyze the underlying principles, and basis of the psychology behind learning, memory and experience
- Explain cognitive abilities and intelligence from a psychological perspective
- Examine the different phases and stages in human development
- Examine the different motivation theories and the psychological basis of emotions
- Explain sexuality and gender in relation to psychology
- Examine psychoanalytic approaches and humanistic theories to explain behaviors, and traits in personalities
- Evaluate health psychology, and approaches to health management
- Investigate the different mental disorders as related to psychology
- Analyze psychotherapy, the different methods and their effectiveness
- Investigate the importance of thoughts, trends in social behavior, and impact of social influences

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**TEXTBOOKS**

Psychology, 4th Edition

Ciccarelli, Saundra K. & Meyer, J. Noland

Pearson; 2015; Flesch-Kincaid Reading Grade Level: 11.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each

teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model

### **Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments (classroom and online work)	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

### **Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

### **Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

### **GRADING POLICY**

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point	N/A

		Average; Requires make-up work.	
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the drop/add period.	N/A
Withdrawal	W	Withdrawal after the drop/add period.	N/A
Pass	P	Received by students in internships/externships. "P" is not considered in computing the Grade Point Average.	N/A
Non-Pass	NP	Received by students in internships/externships. "NP" is not considered in computing the Grade Point Average.	N/A
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Repeat Course	**	Received by students who repeat a course.	N/A
Retaken Course	R*	If a student is given an exception, the Registrar can over-ride course retake.	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than a Lincoln Educational Services School. "TR" is not considered in computing the Grade Point Average.	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average.	N/A

A student earning a grade of **D-** or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of **F** has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to maintaining an overall program **GPA of 2.0**

#### ATTENDANCE POLICY

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE

At a minimum, students must achieve the following: a passing grade of **D-** or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**TOPICAL OUTLINE****Lesson Title: The field of psychology**

- Origins
- Key issues
- Current trends

**Homework: Reading assignment; lab assignment**

**Lesson Title: Biological basis of behavior**

- Sensation and perception
- Nature vs. nurture
- Sensation, perception, heredity and genetics

**Homework: Reading assignment; lab assignment**

**Lesson Title: Consciousness**

- Interpretation of dreams
- Sleep and sleep disorders
- Consciousness and self awareness

**Homework: Reading assignment; lab assignment**

**Lesson Title: Learning with Change and Experience**

- Classical conditioning
- Negative reinforcement and punishment
- memory

**Homework: Reading assignment; lab assignment**

**Lesson Title: Cognition and Intelligence**

- Intelligence tests
- Process of thinking and reasoning

**Homework: Reading assignment; lab assignment; review for midterm**

**Lesson Title: Human Development**

- Developmental stages
- Theories

**Homework: Reading assignment; lab assignment**

**Lesson Title: Motivation and Emotion**

- Traditional cultural differences

**Homework: Reading assignment; lab assignment**

**Lesson Title: Sexuality and gender**

- Physical and psychological

- Human sexual behavior
- Sexual dysfunction

**Homework:** Reading assignment; lab assignment

**Lesson Title: Personality and Behavioral Patterns**

- Personality traits
- Measurement methods
- Theories on growth and personality development

**Homework:** Reading assignment; lab assignment

**Lesson Title: Mental disorders**

- Causes
- Nature
- Treatment

**Homework:** Reading assignment; lab assignment; review for final

**Lesson Title: Social thought and behavior**

- Conformity
- Aggression

**STUDENT CENTERED LEARNING ACTIVITIES**

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- Students can access additional information by using:
- [www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation
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- [www.vimeo.com](http://www.vimeo.com)
- [www.youtube.com](http://www.youtube.com)
- [www.video.about.com](http://www.video.about.com)
- [www.ehow.com](http://www.ehow.com)
- [www.khanacademy.org](http://www.khanacademy.org)

**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# Syllabus Syllabus

## ***GEN162 American Government***

### *Instructor Information*

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course is designed to be an exploration of how American government formed in its constitutional roots and how it continues to develop. Topics will include how government is organized, its influencing factors, and the development of public policy.

**LEARNING OBJECTIVES**

Upon completion of this course, students will be able to:

- Describe what government is and why we need it
- Identify the root ideas of American government
- Distinguish identifying characteristics of American democracy and American political culture
- Outline the development of the U.S. Constitution and methods available for amending it
- Define federalism and articulate its development and contrasting views
- Explain Bill of Rights
- The students will explore and identify the origins of American Civil Rights movement and the civil unrest that accompanied that movement. The student will be able to argue on both sides of an issue that will balance the individuals' rights that can be encroached upon in times of International struggle or domestic unrest
- Describe the branches of government
- Explain how Congress is organized and how it operates
- Summarize roles the president plays and the development of presidential power
- Outline the American legal system and the federal court system
- Describe media's influence on the public and public opinion.
- Define and describe major political parties and interest groups.
- Understand campaigns, elections and voting, and social and economic policy
- Describe foreign and defense policy and the role of government in making policy.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**TEXTBOOKS**

Essentials of American Government: Roots and Reform, 2011 National Edition,  
Karen J. O'Connor, Larry J. Sabato, and Alixandra B. Yanus  
Pearson; 2011; Flesch-Kincaid Reading Grade Level: 12.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

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**Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments (classroom and online work)	25%
Professionalism	15%
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Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### **REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

#### **TOPICAL OUTLINE**

##### **Lesson Title: The Political Landscape**

- What is government?
- Root ideas of government
- Characteristics of American democracy and American political culture

Homework: Reading assignment

##### **Lesson Title: Constitution and Federalism**

- Development
- Methods for amendment
- Contrasting views of federalism

Homework: Reading assignment

##### **Lesson Title: Civil liberties and civil rights**

- Bill of rights
- Civil rights movement
- Slavery and equality of sexes

Homework: Web assignment; reading assignment

##### **Lesson Title: Congress**

- Branches of government

Homework: Web assignment; reading assignment; study for midterm

##### **Lesson Title: The Presidency, the Executive Branch and the Federal Bureaucracy**

- Midterm exam

- Presidential power
- Relationship of President to Congress
- Roles of executive branch

Homework: Reading assignment

**Lesson Title: The Judiciary**

- American legal system and federal court system

Homework: Reading assignment

**Lesson Title: Public Opinion, News Media, Political Parties and interest groups**

- Media influence
- Political parties and the media

Homework: Reading assignment; web assignment

**Lesson Title: Campaigns, elections, and voting**

- Patterns of voting
- Types of elections
- Campaign finance
- Social and economic issues

Homework: Reading assignment

**Lesson Title: Foreign and Defense Policy**

- Role of executive branch in making policy
- Influences in shaping policy
- Challenge of balance with domestic affairs

Homework: Study for final

**Lesson Title: Current issues in government**

Homework: Study for final exam

**Review and Final Exam**

**STUDENT CENTERED LEARNING ACTIVITIES**

The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.

Students can access additional information by using:

[www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation

[www.howstuffworks.com](http://www.howstuffworks.com)

[www.vimeo.com](http://www.vimeo.com)

[www.youtube.com](http://www.youtube.com)

[www.video.about.com](http://www.video.about.com)

[www.ehow.com](http://www.ehow.com)

[www.khanacademy.org](http://www.khanacademy.org)

**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# Syllabus Syllabus

## ***GEN180 College Algebra***

### *Instructor Information*

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course focuses on algebraic concepts essential for success in the workplace and other courses. Using real world examples and applications, students practice fundamental operations with number systems, formulas, algebraic expressions and linear equations. This course also explores problems involving factoring, inequalities, exponents, radicals, linear equations, functions, quadratic equations and graphs. Skills for success in mathematics will be emphasized.

**LEARNING OBJECTIVES**

Upon completion of this course, students will be able to:

- Solve problems applying the concept of real numbers and algebraic equations
- Recognize real world applications of real numbers and algebraic equations
- Solve algebraic problems applying the concept of equations and inequalities
- Recognize real world applications of algebraic equations and inequalities
- Explain graphs and linear equations and their applications
- Recognize real world applications of graphs and linear equations
- Solve algebraic problems involving polynomials, exponents and their applications
- Recognize real world application of polynomials and exponents
- Solve algebraic problems involving rational expressions
- Recognize real world applications of rational expressions
- Illustrate the use of graphs, functions and their application
- Recognize real world applications of graphs and linear functions
- Solve algebraic problems involving systems of equations
- Recognize real world applications of systems of equations
- Solve algebraic problems involving compound inequalities and absolute value equations
- Recognize real world applications of compound inequalities and absolute value equations
- Solve algebraic problems involving radical expressions and equations
- Recognize real world applications of radical expressions and equations
- Solve algebraic problems involving concepts of quadratic equations
- Recognize real world applications of quadratic equations
- Solve algebraic problems involving exponential functions
- Recognize real world applications of exponential functions

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**TEXTBOOKS**

Introductory and Intermediate Algebra, 4th Edition w/My Math Lab

Marvin Bittinger

Pearson; 2010; Flesch-Kincaid Reading Level: 11.0



**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model.

**ASSESSMENT CRITERIA & METHOD OF EVALUATING STUDENTS****Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

**GRADING POLICY**

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5

80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0
67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work.	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the drop/add period.	N/A
Withdrawal	W	Withdrawal after the drop/add period.	N/A
Pass	P	Received by students in internships/externships. "P" is not considered in computing the Grade Point Average.	N/A
Non-Pass	NP	Received by students in internships/externships. "NP" is not considered in computing the Grade Point Average.	N/A
Pass	PD	Received by students in Developmental Courses (only applies to Columbia Campus). "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NPD	Received by students in Developmental Courses (only applies to Columbia Campus). "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course.	N/A
Retaken Course	R*	If a student is given an exception, the Registrar can over-ride course retake.	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than a Lincoln Educational Services School. "TR" is not considered in computing the Grade Point Average.	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average.	N/A

A student earning a grade of **D-** or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of **F** has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to maintaining an overall program **GPA of 2.0**

#### ATTENDANCE POLICY

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

**REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE**

At a minimum, students must achieve the following: a passing grade of D- or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences. Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make-up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**TOPICAL OUTLINE****Lesson Title: Exploring Basic Concepts; Real numbers and algebraic equations**

- Basic Math review and expectations
- Skills for success in Mathematics
- The Real Number System and Arithmetic and Properties of Real Numbers

**Homework:** Review sheets, reading assignment

**Lesson Title: Solving equations and inequalities**

- Definitions
- Real world applications

**Homework:** Review sheets, reading assignment

**Lesson Title: Graphs and Linear equations**

- Define graphs
- Need for using graphs
- X and y coordinates

**Homework:** Review sheets, reading assignment

**Lesson Title: Polynomials and factoring**

- Terminology
- Real world applications

**Homework:** Review sheets, reading assignment

**Lesson Title: Rational Expressions**

- Examples
- Terminology
- Adding and Subtracting Rational Expressions.
- Multiplying and Dividing Rational Expressions
- Working with Complex Fractions and Equations Containing Rational Expressions

**Homework:** Review sheets, reading assignment; study for midterm

**Lesson Title: Graphs, Functions and Applications**

- Linear functions

- Domain and range for graphing
- Homework:** Review sheets, reading assignment

**Lesson Title:** Systems of equations

- Equations by elimination
  - Solving applied equations
- Homework:** Review sheets, reading assignment

**Lesson Title:** Compound inequalities and absolute value equations

- Simple and compound inequalities
  - Sets and interval notations
- Homework:** Review sheets, reading assignment

**Lesson Title:** Radical expressions

- Equations and functions
  - Properties
  - Real math problems
- Homework:** Review sheets, reading assignment

**Lesson Title:** Quadratic equations

- Mathematical modeling
  - Completing the square
  - Real math problems
- Homework:** Review sheets, reading assignment; study for final

**Lesson Title:** Exponentials and logarithmic functions

- Reverse, composite, and exponential functions
- Logarithmic functions

**STUDENT CENTERED LEARNING ACTIVITIES**

- The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.
- Students can access additional information by using:
- [www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation
- [www.howstuffworks.com](http://www.howstuffworks.com)
- [www.vimeo.com](http://www.vimeo.com)
- [www.youtube.com](http://www.youtube.com)
- [www.video.about.com](http://www.video.about.com)
- [www.ehow.com](http://www.ehow.com)
- [www.khanacademy.org](http://www.khanacademy.org)

**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# Syllabus Syllabus

## ***GEN190 English Composition I***

### *Instructor Information*

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

Students develop written communication skills, with emphasis placed on the principles of effective communication which includes understanding the writing process, analysis of readings, as can be applied personally and professionally.

**LEARNING OBJECTIVES**

Upon completion of this course, students will be able to:

- Apply the steps of the writing process
- Identify essay components
- Write effective and grammatically correct paragraphs
- Analyze the role of reading and writing in your academic and professional career
- Write effective and grammatically correct essays
- Apply strategies to achieve clarity and effective style in writing
- Differentiate between the writing pattern types
- Identify sentence types, parts of a sentence, and patterns
- Discriminate between proper and improper use of punctuation in writing
- Apply the proper use of punctuation in writing
- Apply the proper use of spelling in writing
- Examine strategies and guidelines for writing an effective research paper
- Write an effective and grammatically correct research paper

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**TEXTBOOKS**

*English Composition package includes three components:*

The Little Brown Essentials Handbook, 8th Edition

Jane Aaron

Pearson; 2012; Flesch-Kincaid Reading Grade Level: 10.5

Wordsmith: Guide to College Writing, 6<sup>th</sup> Edition

Pamela Arlov

Pearson; 2012; Flesch-Kincaid Reading Grade Level: 10.5

My Writing Lab

Pamela Arlov

Pearson; N/A; Flesch-Kincaid Reading Grade Level: N/A

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

This course is delivered via the Residential model

**Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments (classroom and online work)	25%
Professionalism	15%
Midterm Exam	10%
Final Exam	10%
<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

Out-of-Class Assignments are an extension of the classroom/laboratory experience and provide an opportunity for students to research, apply, or practice concepts learned in the classroom. This type of reinforcement strengthens a student's understanding of course competencies. While the type of assignments and time require will vary from course to course and student to student, each student will be required to complete out-of-class assignments which will be included as part of the course final evaluation.

**Professionalism**

Students are expected to come each week prepared to contribute their knowledge and insights. We will all learn from each other. Students are expected to act in a professional manner, meeting deadlines, solving problems, cooperating with classmates and generally contributing in a positive way to the class. Working in the real world often means searching for solutions in a group context. Teamwork, listening, empathy, enthusiasm, emotional maturity and consideration of other people's concerns are essential to success. Please bring these qualities and values with you to class. It is as important to 'practice' these interpersonal skills as it is to learn new intellectual content. Students will be evaluated on their professional demeanor in class.

**GRADING POLICY**

At the end of each course, each student is assigned a final grade as follows:

Percentage	Letter Grade	Interpretation	Point Value
95-100	A	Excellent Plus	4.0
90-94	A-	Excellent	3.9
87-89	B+	Good Plus	3.8
84-86	B	Good	3.5
80-83	B-	Good Minus	3.0
77-79	C+	Average Plus	2.8
74-76	C	Average	2.5
70-73	C-	Average Minus	2.0

67-69	D+	Below Average	1.5
64-66	D	Poor	1.2
60-63	D-	Poor	1.0
59 and below	F	Failing Work	0.0
Incomplete	I	Temporary grade; is not considered in computing Grade point Average; Requires make-up work.	N/A
Withdrawal	WA	Received by students who officially withdraw from a course before the end of the drop/add period.	N/A
Withdrawal	W	Withdrawal after the drop/add period.	N/A
Pass	P	Received by students in internships/externships. "P" is not considered in computing the Grade Point Average.	N/A
Non-Pass	NP	Received by students in internships/externships. "NP" is not considered in computing the Grade Point Average.	N/A
Pass	PD	Received by students in Developmental Courses (only applies to Columbia Campus). "PD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Non-Pass	NPD	Received by students in Developmental Courses (only applies to Columbia Campus). "NPD" is not considered in computing the Grade Point Average or Graduation requirements.	N/A
Repeat Course	**	Received by students who repeat a course.	N/A
Retaken Course	R*	If a student is given an exception, the Registrar can over-ride course retake.	N/A
Transfer Credit	TR	Indicates the school accepted credit earned for previous post-secondary education at an institution other than a Lincoln Educational Services School. "TR" is not considered in computing the Grade Point Average.	N/A
Test Out Credit	TO	Indicates the school accepted credit earned for testing out of a course. "TO" is not considered in computing the Grade Point Average.	N/A

A student earning a grade of **D-** or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of **F** has failed a course. A failed course must be repeated and passed to meet graduation requirements, in addition to maintaining an overall program **GPA of 2.0**

#### ATTENDANCE POLICY

The technical nature of the training and graduate employability goals of the programs offered requires that students attend classes on a regular basis. Consequently, the school's attendance policy will be strictly enforced.

Students who miss class are encouraged to obtain class notes from fellow students. Students are encouraged to meet with their instructors during office hours immediately following an absence. There is no cost for make-up work.

#### REQUIREMENTS FOR SUCCESSFUL COMPLETION OF THE COURSE

At a minimum, students must achieve the following: a passing grade of **D-** or above completion of all required examinations, submission of all required lab exercises and projects, and adherence to the school attendance policy. Any student absent during a pre-assigned test/exam and/or projects date will receive zero as a grade. Make up will be given only for excused absences.



Make up work is the student's responsibility. The student must arrange with the instructor a correct time and place to accomplish the make-up work. It is the students' responsibility to seek the instructor's guidance at the time when a problem area is initially encountered, not after receiving an unsatisfactory grade. Arrangements for the special tutoring must be made with the appropriate educational staff, i.e. instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**TOPICAL OUTLINE****Lesson Title: The Writing Process**

- Steps
- Practice

**Homework:** Writing assignment; reading assignment

**Lesson Title: Paragraphs**

- Characteristics of effective paragraphs
- Topic sentences

**Homework:** Writing assignment; reading assignment

**Lesson Title: College writing**

- Academic writing skills
- Reading for success
- Argument
- Media writing

**Homework:** Writing assignment; reading assignment

**Lesson Title: Introduction to Essays**

- Key elements
- Introduction, body, conclusion
- Common errors

**Homework:** Writing assignment; reading assignment

**Lesson Title: Clarity and style**

- Emphatic writing
- Variety
- Language

**Homework:** Writing assignment; reading assignment; study for midterm

**Lesson Title: Patterns of writing**

- Description, narration, classification and compare and contrast

**Homework:** Writing assignment; reading assignment

**Lesson Title: Writing a Summary**

- Steps
- Paraphrasing

**Homework:** Writing assignment; reading assignment

**Lesson Title: Sentence parts and patterns**

- Parts of speech
- Sentence errors
- Types of sentences

**Homework: Writing assignment; reading assignment**

**Lesson Title: Spelling and Punctuation**

- Rules
- Common errors

**Homework: Writing assignment; reading assignment**

**Lesson Title: Research writing**

- Characteristics
- Steps
- Writing styles

**Homework: Writing assignment; reading assignment; study for final**

**Lesson Title: Putting it all together**

- Papers due

**STUDENT CENTERED LEARNING ACTIVITIES**

- The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.
- Students can access additional information by using:
- [www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation
- [www.howstuffworks.com](http://www.howstuffworks.com)
- [www.vimeo.com](http://www.vimeo.com)
- [www.youtube.com](http://www.youtube.com)
- [www.video.about.com](http://www.video.about.com)
- [www.ehow.com](http://www.ehow.com)
- [www.khanacademy.org](http://www.khanacademy.org)

**DATE SYLLABUS WAS LAST REVIEWED**

April 28, 2015

# Syllabus Syllabus

## ***GEN292 Speech Communication***

### *Instructor Information*

**Name:**

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**Phone Number:**

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**Email:**

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**Office Hours:**

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**INSTRUCTOR**

To be announced upon onset of program.

**COURSE DESCRIPTION**

This course will enhance the student's understanding and appreciation of the uses of oral and written communication and will teach the skills needed to write and speak effectively in a variety of situations.

**LEARNING OBJECTIVES**

After completing this course, the student will be able to:

- Understand the basic principles of oral communication.
- Select and adapt topics to meet the needs and interests of particular audiences.
- Demonstrate the ability to collect, analyze, and use information to develop and adapt messages for particular purposes and settings.
- Organize ideas and supporting materials in a coherent and captivating message.
- Develop delivery skills by using voice, body, and gestures effectively in presenting speeches.
- Develop the ability to speak competently, confidently, and ethically in public communication situations.
- Become a more effective supportive listener.

**PREREQUISITE(S)**

None

**CONTACT HOURS**

45 Contact Hours (45 Lecture Hours and 0 Lab Hours)

**CREDIT HOURS**

3.0 Semester Credit Hours

**INSTRUCTIONAL MATERIALS AND REFERENCES**

(Bundle)

Essentials of Human Communication, 8th Edition

(Text and Lab)

Joseph DeVito

Pearson; 2014; Flesch-Kincaid Reading Grade Level: 10.0

**INSTRUCTIONAL METHODS**

A variety of teaching strategies will be used throughout this course. These may include, but are not limited to daily lectures, classroom discussions, simulations, case studies, classroom/laboratory exercises, demonstrations, and assessments. The use of multimedia such as audio visual aids, DVDs, CDs and internet sites may be inserted as appropriate during each teaching-learning activity. The use of the campus "Learning Resource Center" will also be used as appropriate to complete assigned research.

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**Grade Distribution**

Out-of-Class Assignments	10%
Assessments (quizzes, practicals )	30%
Class Assignments (classroom and online work)	25%
Professionalism	15%
Midterm Exam	10%
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<b>Total</b>	<b>100%</b>

**Out-of-Class Assignments**

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**Professionalism**

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**GRADING POLICY**

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Percentage	Letter Grade	Interpretation	Point Value
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#### ATTENDANCE POLICY

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instructor, education supervisor or academic dean. Make up work, instructor guidance, and special tutoring is provided at no additional cost to the student.

**TOPICAL OUTLINE****Lesson Title: Essentials of Human Communication**

Models and concepts  
Principles of Communication  
Culture and Human Communication  
Media literacy  
Homework: Skill development exercises

**Lesson Title: Self and perception**

Self disclosure  
Perception  
Others' perceptions  
Homework: Skill development exercises

**Lesson Title: Listening**

Importance of listening  
Stages of listening  
Culture and gender  
Homework: Skill development

**Lesson Title: Verbal Messages**

Principles of verbal messages  
Using verbal messages effectively  
**Homework: Skill Development exercises**

**Lesson Title: Non verbal messages**

Functions of non verbal messages  
Channels  
Culture, gender and non verbal messages  
**Homework: Skill Development exercises; study for midterm**

**Lesson Title: Interpersonal communication, conversation, and relationships**

Principles of conversation  
Stages  
Theories of interpersonal communication and relationships  
Culture, technology, work, and relationships  
Midterm  
**Homework: Skill Development exercises**

**Lesson Title: Managing Interpersonal conflict and Small Group communication**

Principles of conflict  
Conflict management strategies  
Win-win solutions  
Problem solving groups  
Members and leaders in small group communication  
**Homework: Skill Development exercises**

**Lesson Title: Public speaking preparation**

Six steps:

- Selecting topic
- Analyzing the audience
- Researching your topic
- Formulating the thesis and identifying your main points
- Supporting your main points
- Organizing your information

**Homework: Skill development exercises; information literacy assignment**

**Lesson Title: Public speaking preparation and delivery**

Steps

- Wording your speech
- Constructing your conclusion and introduction
- Rehearsing your speech
- Delivering your speech
- Evaluating speeches

**Homework: Skill development exercises**

**Lesson Title: Types of speeches**

- Informative speeches
- Persuasive speeches
- Presentation aids
- Supporting materials

**Homework: Skill development exercises; study for final**

**Lesson Title: Putting it all together**

Speeches and review

**Lesson Title: Final Exam****STUDENT CENTERED LEARNING ACTIVITIES**

- The following activities and projects selected for this course are targeted to encourage active student participation in class and provoke critical thinking skills required for the workplace. They will be incorporated at the instructor's discretion.
- Students can access additional information by using:
- [www.howjsay.com](http://www.howjsay.com): Great resource for pronunciation
- [www.howstuffworks.com](http://www.howstuffworks.com)
- [www.vimeo.com](http://www.vimeo.com)
- [www.youtube.com](http://www.youtube.com)
- [www.video.about.com](http://www.video.about.com)
- [www.ehow.com](http://www.ehow.com)
- [www.khanacademy.org](http://www.khanacademy.org)



**DATE SYLLABUS WAS LAST REVIEWED**

February 17, 2015

# **EEST410A Electrical and Electronic Systems Technology Service Management- Columbia**

## **Campus**

### **Booklist**

Course	Title	Author	Publisher	Year		Reading Level	List Price	LESC Price	Cost to Student
EEST101 Introduction to the Trades	Core Curriculum – Introductory Craft Skills – Trainee Guide	National Center for Construction Education and Research	Pearson Prentice Hall	2015	0-13608637-3	9.0	\$68.00	\$51.00	\$80.58
EEST102 Material Applications	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 1, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769174	9.0	\$89.33	\$67.00	\$105.86
	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 2, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769181	9.0	\$128.00	\$96.00	\$151.68
EEST103 Electronic and Electrical Principles	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 1, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769174	9.0	PPC	PPC	PPC
	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 2, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769181	9.0	PPC	PPC	PPC
EEST104 Basic Electricity	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 1, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769174	9.0	PPC	PPC	PPC
EEST105 Electrical Wiring Principles	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 2, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769181	9.0	PPC	PPC	PPC
EEST206 Electrical Controls	NCCERconnect with Pearson eText-Trainee Access Card for Electrical Level 2, 7/e	National Center for Construction Education and Research	Pearson Prentice Hall	2014	978-013-2769181	9.0	PPC	PPC	PPC
EEST207 Computers and Networking	NCCERconnect with Pearson eText-Trainee Access Card for Electronic Systems Technician Level 3, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2011	978-013-2994552	10.0	\$125.33	\$94.00	\$148.52
EEST208 Fiber Optics, Telecommunication Systems & PLC	NCCERconnect with Pearson eText-Trainee Access Card for Electronic Systems Technician Level 3, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2011	978-013-2994552	10.0	PPC	PPC	PPC
	NCCERconnect with Pearson eText Trainee Access Card – for Electronic Systems Technician Level 4, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2012	978-013-2994606	12.0	\$125.33	\$94.00	\$148.52
EEST209 Security Systems, Access Control and CCTV Systems	NCCERconnect with Pearson eText Trainee Access Card – for Electronic Systems Technician Level 4, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2012	978-013-2994606	12.0	PPC	PPC	PPC
EEST210 Fire Alarm Systems	NCCERconnect with Pearson eText-Trainee Access Card for Electronic Systems Technician Level 3, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2011	978-013-2994552	10.0	PPC	PPC	PPC
	NCCERconnect with Pearson eText Trainee Access Card – for Electronic Systems Technician Level 4, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2012	978-013-2994606	12.0	PPC	PPC	PPC
EEST211 A/V Home Theater and Sat/Cable TV	NCCERconnect with Pearson eText-Trainee Access Card for Electronic Systems Technician Level 3, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2011	978-013-2994552	10.0	PPC	PPC	PPC
	NCCERconnect with Pearson eText Trainee Access Card – for Electronic Systems Technician Level 4, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2012	978-013-2994606	12.0	PPC	PPC	PPC
EEST212 System Integration	NCCERconnect with Pearson eText Trainee Access Card – for Electronic Systems Technician Level 4, 3/e	National Center for Construction Education and Research	Pearson Prentice Hall	2012	978-013-2994606	12.0	PPC	PPC	PPC
<b>General Education Courses</b>									
GEN130 Introduction to Critical Thinking	The Art of Thinking (A Guide to Critical Thinking and Creative Thought) 10th Edition Case Studies for the First Year: An Odyssey into Critical Thinking and Problem Solving	Ruggiero, Vincent Sherfield, Rob	Pearson	2012	0-205-11938-7/978-0-205-11938-7; 0-13-111525-1	11.0	\$82.68	\$43.82	\$69.24
GEN150 Environmental Science	Essential Environment: The Science Behind The Stories 4th Edition	Withgott, Jay	Pearson	2011	0-321-75290-2/978-0-321-7590-1	11.0	\$129.71	\$68.75	\$108.62
GEN160 Psychology	Psychology 2nd National Edition	Ciccarelli, Sandra K. & Meyer, J. Noland	Pearson	2008	0-205-25641-4/978-0-205-25641-9	11.0	\$161.02	\$85.34	\$134.84

# **EEST410A Electrical and Electronic Systems Technology Service Managment- Columbia Campus**

## **Booklist**

Course	Title	Author	Publisher	Year		Reading Level	List Price	LESC Price	Cost to Student
GEN162 American Government	Essentials of American Government: Roots and Reform 2011 National Edition	Karen J. O'Connor, Larry J. Sabato, and Alixandra B. Yanus	Pearson	2011	0-205-77130-0/978-0-205- 77130-1	12.0	\$107.33	\$56.88	\$89.88
GEN180 College Algebra	Introductory and Intermediate Algebra, w/My Math Lab 4th Edition	Bittinger, Marvin	Pearson	2010	0-55-876626-9	11.0	\$175.79	\$93.17	\$147.21
GEN190 English Composition I	<u>The Little Brown Compact Handbook 8th Edition</u> <u>Wordsworth: Guide to College Writing 6th Edition</u> My Writing Lab Handbook	<u>Aaron, Jane</u> <u>Arlov, Pamela</u> Arlov, Pamela	Pearson	2011 2012	0-205-23660-x/978-0-205- 23660-2; 0-205- 25127-7/978-0-205- 25127-8	<u>10.5</u> <u>10.0</u> N/A	\$109.53	\$58.05	\$91.72
GEN292 Speech Communication	Essentials of Human Communication (Text and Lab) 7th Edition	DeVito, Joseph	Pearson	2010	0-55-876625-0	10.0	\$120.72	\$63.98	\$101.09
GEN089 Basic Mathematics	Basic College Mathematics 6th Edition	Tobey, John and Slater, Jeffrey	Pearson	2009	978-0-1320-8515-1	10.5	\$161.09	\$85.38	\$134.90
GEN099 Foundations of English	<u>The Writer's World: Paragraphs and Essays</u> Applying English to Your Career 2nd Edition	Gaetz, Lynne & Phadke, Suneeti Davis, Deborah	Pearson	2011	0-55-876847-4	<u>9.5</u> 10.0	\$143.51	\$76.06	\$120.18

## EEST410A Tool & Equipment Costs

QTY. REQ.	ITEM	Access Item?	Source	Cost/Each	Total
15	110 5 Pair Punch Tool		Cable Plus	\$75.00	\$1,125.00
2	Air Compressor Pancake		Home Depot	\$200.00	\$400.00
2	Air Hoses		Home Depot	\$29.00	\$58.00
15	Alarm Panel		ADI	\$128.00	\$1,920.00
15	Alarm Panel		ADI	\$128.00	\$1,920.00
10	Altronix Power Supply		ADI	\$45.00	\$450.00
10	Altronix Timers 4 Channel		ADI	\$125.00	\$1,250.00
30	Architects Scale Tri-scale		Reliable Office	\$8.00	\$240.00
10	Ball Peen Hammer		NAPA	\$8.00	\$80.00
4	Bandsaw Portable		Menards	\$210.00	\$840.00
30	Batteries Rechargeable		ADI	\$25.00	\$750.00
5	Battery Drill DW954 14.4V		NAPA	\$180.00	\$900.00
6	Battery Drill DW980 12V		NAPA	\$159.00	\$954.00
6	Battery Power Pak DW9071		NAPA	\$25.00	\$150.00
6	Battery Power Pak DW9118		NAPA	\$25.00	\$150.00
1	Box wrench 1"		NAPA	\$87.00	\$87.00
6	Box wrench set Metric11 Pc		NAPA	\$69.00	\$414.00
6	Box wrench set SAE12 Pc		NAPA	\$69.00	\$414.00
1	Brad Nailer		Home Depot	\$289.00	\$289.00
2	Cable Cutter		Cable Plus	\$18.00	\$36.00
1	Cable DSL Router			\$80.00	\$80.00
1	Cable Modem			\$159.00	\$159.00
4	Cable Tester Display Max		Toner	\$1,600.00	\$6,400.00
30	Calculators Cannon		Reliable	\$10.00	\$300.00
2	Camera AXIS 2120 Color		ADI	\$850.00	\$1,700.00
3	Camera B/W w/Lens		ADI	\$165.00	\$495.00
3	Camera Color w/Lens		ADI	\$350.00	\$1,050.00
6	Camera Mounts		ADI	\$22.00	\$132.00
1	Camera PIR Covert		ADI	\$400.00	\$400.00
1	Caulking Gun		NAPA	\$8.00	\$8.00
1	CCTV to Fiber Receiver		ADI	\$200.00	\$200.00
1	CCTV to Fiber Transmitter		ADI	\$150.00	\$150.00
6	Chalk Line		NAPA	\$9.00	\$54.00
1	Channel Bank		Donation	\$7,000.00	\$7,000.00
10	Channel lock		NAPA	\$18.00	\$180.00
10	Channellock Pliers 12"		NAPA	\$22.00	\$220.00
10	Channellock Pliers 5"		NAPA	\$12.00	\$120.00
5	Chisel set 4 Pc		NAPA	\$28.00	\$140.00
6	Circuit Breaker Finder CS-500A		Home Depot	\$57.00	\$342.00
6	Clamp On Ampmeter		Grainger	\$100.00	\$600.00

## EEST410A Tool & Equipment Costs

QTY. REQ.	ITEM	Access Item?	Source	Cost/Each	Total
10	Claw Hammer		Menards	\$12.00	\$120.00
15	Coax Crimpmaster		Cable Plus	\$45.00	\$675.00
10	Coax Stripper		Cable Plus	\$56.00	\$560.00
6	Conduit Bender 1/2"		Home Depot	\$20.00	\$120.00
5	Conduit Bender 3/4"		Home Depot	\$30.00	\$150.00
6	Conduit Bender Hickey 1/2"		Home Depot	\$22.00	\$132.00
6	Conduit Reamer		Home Depot	\$40.00	\$240.00
12	Continuity Tester		NAPA	\$12.00	\$144.00
6	Coping Saw		NAPA	\$8.00	\$48.00
2	Crescent Wrench 10"		NAPA	\$20.00	\$40.00
2	Crescent Wrench 12"		NAPA	\$15.00	\$30.00
2	Crescent Wrench 4"		NAPA	\$9.00	\$18.00
2	Crescent Wrench 6"		NAPA	\$14.00	\$28.00
2	Crescent Wrench 8"		NAPA	\$17.00	\$34.00
6	Crosscut Saw		Menards	\$32.00	\$192.00
15	Diagonal Pliers 6"		NAPA	\$15.00	\$225.00
6	Digital Level		Menards	\$95.00	\$570.00
1	Digital Sound Level Meter		RadioShack	\$80.00	\$80.00
5	Drill 1/2" Hammer DW505		NAPA	\$225.00	\$1,125.00
1	Drill 1/2" Right Angle DW120		NAPA	\$125.00	\$125.00
6	Drill 3/8" Power DW106		NAPA	\$69.00	\$414.00
1	Drill 3/8" Right Angle DW160		NAPA	\$100.00	\$100.00
15	Drill Bits Index Assorted		NAPA	\$50.00	\$750.00
2	Drill Dremel Kit with bits		Menards	\$90.00	\$180.00
3	Drop Light Fluorescent		Menards	\$22.00	\$66.00
3	Drop Light Incandescent		Menards	\$15.00	\$45.00
6	Drywall Saw		Menards	\$15.00	\$90.00
2	DSC LCD Keypad for 832		SES	\$80.00	\$160.00
2	DSC LCD Keypad for 832		SES	\$80.00	\$160.00
1	DVD Player		Sam's Club	\$150.00	\$150.00
12	DVM Multimeter Fluke		NAPA	\$120.00	\$1,440.00
30	Engineers Rule Tri-scale		ABC	\$10.00	\$300.00
6	Face Shield Full		Menards	\$25.00	\$150.00
1	Fiber Continuity Tester		Cable Plus	\$125.00	\$125.00
1	Fiber Continuity Tester		Cable Plus	\$125.00	\$125.00
1	Fiber Continuity Tester		Cable Plus	\$125.00	\$125.00
1	Fiber Continuity Tester		Cable Plus	\$125.00	\$125.00
2	Fiber Light Pen		Cable Plus	\$22.00	\$44.00
6	Fiber Sapphire Scribe		Cable Plus	\$90.00	\$540.00
6	Fiber Scissors		Cable Plus	\$65.00	\$390.00

## EEST410A Tool & Equipment Costs

QTY. REQ.	ITEM	Access Item?	Source	Cost/Each	Total
6	Fiber Scope		Cable Plus	\$500.00	\$3,000.00
100	Fiberoptic ST Adhesive Conn	X	Cable Plus	\$4.00	\$400.00
1	File 8" Half Round Bastard		Menards	\$8.00	\$8.00
6	File 8" Hobby Rasp		Menards	\$10.00	\$60.00
1	File 8" Mill Bastard		Menards	\$12.00	\$12.00
1	File 8" Round Bastard		Menards	\$14.00	\$14.00
1	File Set		Menards	\$45.00	\$45.00
1	Finishing Nailer		Home Depot	\$220.00	\$220.00
2	Fire Alarm Panel		ADI	\$200.00	\$400.00
1	Fire Alarm Panel		ADI	\$650.00	\$650.00
1	Fire Alarm Panel		Donation	\$1,000.00	\$1,000.00
2	Fish Tape 100 Ft		Home Depot	\$60.00	\$120.00
6	Fish Tape 50 Ft		Home Depot	\$45.00	\$270.00
1	Fishing Acc Kit		Cable Plus	\$250.00	\$250.00
6	Flush Cut Saw		Menards	\$20.00	\$120.00
1	Framing Nailer		Home Depot	\$175.00	\$175.00
10	Framing Square		Menards	\$28.00	\$280.00
1	Freq Counter BK 1856C		Electronix	\$600.00	\$600.00
3	Freq Counter GW GFC-8270H		Electronix	\$500.00	\$1,500.00
3	Freq Counter GW GFC-8270H		Electronix	\$500.00	\$1,500.00
3	Freq Counter GW GFC-8270H		Electronix	\$500.00	\$1,500.00
6	Gloves Safety		Menards	\$18.00	\$108.00
6	Grinder Orbital DW402		NAPA	\$55.00	\$330.00
1	Ground Resistance Tester		Grainger	\$650.00	\$650.00
6	Hack saw		Menards	\$15.00	\$90.00
3	Harris TDR TS-100 Cable Tstr		Cable Plus	\$300.00	\$900.00
30	Horn Strobe Units		ADI	\$22.00	\$660.00
2	Kellem Grip		Cable Plus	\$35.00	\$70.00
6	Kevlar Scissors		Cable Plus	\$65.00	\$390.00
6	Key Hole Saw		Menards	\$25.00	\$150.00
30	Keypad Alpha		ADI	\$112.00	\$3,360.00
2	Ladder Ext. Fiberglass 24 Ft		Menards	\$285.00	\$570.00
1	Ladder Step Fiberglass 10 Ft.		Menards	\$85.00	\$85.00
2	Ladder Step Fiberglass 6 Ft		Menards	\$65.00	\$130.00
2	Ladder Step Fiberglass 8 Ft		Menards	\$75.00	\$150.00
6	Laptop Computer		Focus Tech	\$2,000.00	\$12,000.00
15	Learning Labs Electronic		Radio Shack	\$65.00	\$975.00
1	Lighting Controller		Donation	\$650.00	\$650.00
10	Linemans Pliers 8"		NAPA	\$18.00	\$180.00
6	Linkmaster Cable Tester		Cable Plus	\$550.00	\$3,300.00



## EEST410A Tool & Equipment Costs

QTY. REQ.	ITEM	Access Item?	Source	Cost/Each	Total
11	Lite-Strip 1-Step Fiber Stripper		Cable Plus	\$55.00	\$605.00
10	Long Nose Pliers		NAPA	\$18.00	\$180.00
15	Measuring Tapes 25'		NAPA	\$10.00	\$150.00
1	Megohmmeter		Grainger	\$650.00	\$650.00
4	Microscanner Pro Wiremapper		Cable Plus	\$285.00	\$1,140.00
4	MicroTest SimpliFiber Meter		Microtest	\$300.00	\$1,200.00
4	MicroTest SimpliFiber Remote		Microtest	\$250.00	\$1,000.00
30	Mini Scales Tri-scale (ABC)		ABC	\$5.00	\$150.00
6	Miter Saw		Menards	\$28.00	\$168.00
1	Modulator Agile UHF/CATV		ADI	\$125.00	\$125.00
30	Motion Detectors Pir		ADI	\$12.00	\$360.00
15	Nail Cutter		Menards	\$28.00	\$420.00
6	Noyes Optical Power Meter		Cable Plus	\$595.00	\$3,570.00
2	Omni Fiber Adapter Head		Cable Plus	\$850.00	\$1,700.00
4	OmniScanner LT Remote		Cable Plus	\$1,500.00	\$6,000.00
4	OmniScanner LT Tester		Cable Plus	\$3,500.00	\$14,000.00
15	Oscilloscope 2 Band Digital		Microtek	\$900.00	\$13,500.00
10	Pliers Long Nose		NAPA	\$22.00	\$220.00
6	Pop Rivet Gun		Menards	\$18.00	\$108.00
15	Powered Breadboard Proto 203A		Electronix	\$125.00	\$1,875.00
5	Premier Master Ratchet Tool		Cable Plus	\$45.00	\$225.00
10	Pull Stations		ADI	\$22.00	\$220.00
15	Punch Down Tool SB 66/110		Cable Plus	\$65.00	\$975.00
5	Punch set 5 Pc		NAPA	\$35.00	\$175.00
2	Push Pull Wiring Rods		ADI	\$65.00	\$130.00
12	Razor Knives		NAPA	\$10.00	\$120.00
15	RJ 45 Crimper		Cable Plus	\$45.00	\$675.00
1	RMS Power Wattmeter		Grainger	\$650.00	\$650.00
30	Ruler Steel 12"		Menards	\$12.00	\$360.00
40	Running Lights		Murrays	\$5.00	\$200.00
5	Saber Saw DW321		NAPA	\$45.00	\$225.00
6	Sander Belt DW430		NAPA	\$65.00	\$390.00
4	Satellite Dish (Terk)		Circuit City	\$100.00	\$400.00
3	Satellite Finder (Analog)		ADI	\$45.00	\$135.00
3	Satellite Receiver SAT-B55		Circuit City	\$100.00	\$300.00
6	Saw 7.25 Circular DW364		NAPA	\$65.00	\$390.00
12	Screwdriver Set 6 Pc		NAPA	\$20.00	\$240.00
4	Serial Cords		Menards	\$18.00	\$72.00
1	Shop Vac 2HP Wet Dry		Home Depot	\$75.00	\$75.00
3	Shovel		Menards	\$45.00	\$135.00

## EEST410A Tool & Equipment Costs

QTY. REQ.	ITEM	Access Item?	Source	Cost/Each	Total
6	Signal Function Generator		Electronix	\$350.00	\$2,100.00
10	Smoke Detectors		ADI	\$40.00	\$400.00
6	Snap N Seal Coax Tool		ADI	\$80.00	\$480.00
6	Socket Set 21 Pc		NAPA	\$25.00	\$150.00
30	Soldering Irons Mini		NAPA	\$18.00	\$540.00
1	Spectrum Analyzer		Toner	\$2,900.00	\$2,900.00
2	Stanley DigiScan		Menards	\$30.00	\$60.00
1	Staple Gun Arrow T50		Menards	\$55.00	\$55.00
3	Staple Gun Arrow T59 Inslt		Toner	\$95.00	\$285.00
2	Stud Punch		Menards	\$200.00	\$400.00
10	Super Bar Claw		Home Depot	\$30.00	\$300.00
2	Surroud Sound System		Sam's Club	\$700.00	\$1,400.00
6	Switch 10/100			\$150.00	\$900.00
6	Telephone Test Set (TS30)		Cable Plus	\$175.00	\$1,050.00
6	Tin Snips		NAPA	\$10.00	\$60.00
6	Toner/Tracer		Cable Plus	\$100.00	\$600.00
6	Tool Pouch		NAPA	\$15.00	\$90.00
6	Torque Wrench		NAPA	\$35.00	\$210.00
1	Tripod		Menards	\$50.00	\$50.00
2	Tubing Cutter circular		Menards	\$35.00	\$70.00
2	TV 27" Color Component		Sam's Club	\$325.00	\$650.00
3	TV Antennas		Radio Shack	\$35.00	\$105.00
1	Vacuum Wire Fishing		Cable Plus	\$400.00	\$400.00
6	Video Amplifier		ADI	\$230.00	\$1,380.00
4	Video Switcher 9 Channel		ADI	\$500.00	\$2,000.00
4	Vider Switcher 4 Channel		ADI	\$500.00	\$2,000.00
12	Vise Grip Pliers		NAPA	\$18.00	\$216.00
4	Wet Noodle Fishing Line		ADI	\$35.00	\$140.00
10	Wire Brush		NAPA	\$15.00	\$150.00
10	Wire Stripper		NAPA	\$18.00	\$180.00
2	Wire Stripper Clauss		NAPA	\$35.00	\$70.00
2	Wireless Access Repeater		Focus Tech	\$225.00	\$450.00
1	Wireless Microphone		Radio Shack	\$160.00	\$160.00
6	Wireless PCI Card		Focus Tech	\$120.00	\$720.00
6	Wireless PCMCIA Card		Focus Tech	\$120.00	\$720.00
1	Wood Chisels 6 set		Home Depot	\$25.00	\$25.00
2	Wood Clamp 2 Ft		NAPA	\$18.00	\$36.00
2	Wood Clamp 3 Ft		NAPA	\$22.00	\$44.00
2	Wood Clamp 4 Ft		NAPA	\$28.00	\$56.00
14	X-10 Components Misc		ADI	\$650.00	\$9,100.00



## EEST410A Tool & Equipment Costs

QTY. REQ.	ITEM	Access Item?	Source	Cost/Each	Total
2	X-10 Line Testers		ADI	\$300.00	\$600.00
2	Zircon Triscanner		Menards	\$50.00	\$100.00
2	Zircon Videoscanner 5.5		Menards	\$35.00	\$70.00
15	CD-ROM Drives		Focus Tech	\$40.00	\$600.00
15	DVD-ROM Drives		Focus Tech	\$80.00	\$1,200.00
3	Cell Phones		Donation	\$55.00	\$165.00
6	DW421 Palm Sanders		NAPA	\$85.00	\$510.00
12	Wire Cutters		NAPA	\$20.00	\$240.00
15	Breadboards JDR PDS100		Electronix	\$125.00	\$1,875.00
1	12" Video Monitor		ADI	\$175.00	\$175.00
1	9" Color Video Monitor		ADI	\$225.00	\$225.00
1	Time laps recorder		ADI	\$450.00	\$450.00
6	8" commercial speakers/w Hats		ADI	\$35.00	\$210.00
1	FM Tuner		Radio Shack	\$200.00	\$200.00
1	AT-10 Transformer		ADI	\$25.00	\$25.00
3	Video camera power supplies		ADI	\$125.00	\$375.00
30	110 Blocks		Cable Plus	\$22.00	\$660.00
30	66 Blocks		Cable Plus	\$12.00	\$360.00
6	Plumb Bob		Home Depot	\$12.00	\$72.00
2	Lil Tugger		Cable Plus	\$250.00	\$500.00
1	PVC Bender-Electric		Menards	\$250.00	\$250.00
6	6-1010 Air Chisel Kits		NAPA	\$65.00	\$390.00
4	Come-A-Long		Home Depot	\$175.00	\$700.00
4	4-ton Hydraulic jacks		NAPA	\$25.00	\$100.00
2	ID Pal Labelers		Cable Plus	\$150.00	\$300.00
1	Camera Wireless Kit		ADI	\$600.00	\$600.00
4	D46 Workshop Vise		NAPA	\$115.00	\$460.00
2	Dw756 Bench Grinder		NAPA	\$59.00	\$118.00
8	Mobile Telecom & Training Boards		Laterza	\$850.00	\$6,800.00
10	Wall Mounted Materials & Methods Trainers		Laterza	\$750.00	\$7,500.00
2	Telephone Poles (if not donated)		TBD		\$0.00
2	Security Alarm System Trainer		CCP	\$4,400.00	\$8,800.00
10	Electrical Trainer		Hamdpen	\$2,200.00	\$0.00
1	Power Distribution Trainer		Hamdpen	\$30,000.00	\$30,000.00
2	PLC Trainer		Hamdpen	\$15,400.00	\$30,800.00
					\$258,509.00
TOTAL					\$258,509.00

**TABLE 1: RESOURCES:**

<b>Resource Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
1. Reallocated Funds	67,868.00	27,147.00	0	0	0
2. Tuition/Fee Revenue (c + g below)	105,880.00	317,655.00	423,540.00	444,717.00	465,894.00
a. Number of F/T Students	10	15	20	21	22
b. Annual Tuition/Fee Rate	10,588.00	21,177.00	21,177.00	21,177.00	21,177.00
c. Total F/T Revenue (a x b)	105,880.00	317,655.00	423,540.00	444,717.00	465,894.00
d. Number of P/T Students	0	0	0	0	0
e. Credit Hour Rate	0	0	0	0	0
f. Annual Credit Hour Rate	0	0	0	0	0
g. Total P/T Revenue (d x e x f)	0	0	0	0	0
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 – 4)	173,748.00	344,802.00	423,540.00	444,717.00	465,894.00

**TABLE 2: EXPENDITURES:**

<b>Expenditure Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
1. Faculty (b + c below)	66,838.00	271,778.00	271,778.00	338,624.00	338,624.00
a. # FTE	3	4	4	5	5
b. Total Salary	53,470.00	217,422.00	217,422.00	270,899.00	270,899.00
c. Total Benefits	13,368.00	54,356.00	54,356.00	67,725.00	67,725.00
2. Admin. Staff (b + c below)	No Change	0	0	0	0
a. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
3. Support Staff (b + c below)	No Change	0	0	0	0
a. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
4. Equipment	2500.00	5000.00	5000.00	5000.00	5000.00
5. Library	1000.00	1000.00	1000.00	1000.00	1000.0
6. New or Renovated Space	N/A				
7. Other Expenses	N/A				
TOTAL (Add 1 – 7)	70,338.00	277,778.00	277,778.00	346,124.00	346,124.00